

**HOW TO IMPLEMENT CUSTOMER KNOWLEDGE
MANAGEMENT (CKM) AT TRIGO**



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entitled
**HOW TO IMPLEMENT CUSTOMER KNOWLEDGE
MANAGEMENT (CKM) AT TRIGO**

was submitted to the College of Management, Mahidol University
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HOW TO IMPLEMENT CUSTOMER KNOWLEDGE MANAGEMENT (CKM) AT TRIGO

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ABSTRACT

TRIGO is a company that has a strong global presence in four continents include America, Africa, Europe and Asia respectively. Notwithstanding, there are problems about the knowledge management that have never been handled. The purpose of this project is to propose a way to implement the customer knowledge management for TRIGO. The research methodology has been conducted through 4 phases include diagnosis phase, benchmarking phase, definition of service standard phase, and the recommendation phase serially.

After analyzing the internal needs within the company, researcher found interesting facts about the root cause of the currently inefficient process. The benchmarking phase implied that the well-established current knowledge sharing platform has already been the right answer for the company. However, the full potential has never been squeezed out since it is not only about the tool aspect that needed to be taken into account. The service standard offer phase would create the mental image for the clients in terms of what they can anticipate to get from the provided services offered by the company. After all, the proposed CKM model was proposed in the recommendation chapter as a guideline for the CKM strategy implementation in the future. However, there will still be some facets out of the scope of the project that needed to be further developed and will be described in the paper. Nonetheless, the proposed results have been highly appreciated by the company and the outcomes will become the starting point for CKM system development within TRIGO.

KEY WORDS: Customer Knowledge Management/ Knowledge Sharing Platform/
Process/ Knowledge/ Human Resource

98 pages

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CHAPTER I

INTRODUCTION

1.1 Background

Referring to the company project which was the assignment at IAE Toulouse, Universite' Toulouse 1 Capitole, the researcher was assigned to work with TRIGO for three months. First of all, the researcher would like to illustrate the company overview to enhance a common understanding in terms of its missions as well as the geographical areas covered as follows.

TRIGO is a quality services provider founded in 1997 to offer quality support and conformity assessment services for the manufacturing sector. TRIGO has become a globally renowned company, serving the automotive, aerospace, railway and other heavy transportation industries with more than 7,000 employees in 400 industrial sites throughout Europe, North Africa, Asia, and South-America. Moreover, TRIGO provides a comprehensive range of corrective and preventive quality inspection and management services, such as sorting & rework, pre-shipment inspection, incoming inspection, NC management, quality resident engineering, suppliers audit, certification support, supplier quality development, quality trainings and so forth. On the other hand, TRIGO provides operational quality management solutions along the supply chain for the manufacturing sector in the transportation industries. Within TRIGO, the Aerospace & Heavy Transportation Business Line is responsible to develop transnational sales to aerospace & heavy vehicles customers by optimizing service portfolio and synergies. It covers international tenders, market intelligence and cross fertilization of best practices between Aerospace & Automotive business segments. Notwithstanding, the project that was proposed by the company is about how to implement customer knowledge management.

WORLD POSITION



Figure 1.1 TRIGO's World Position

KEY FIGURES

7000+
PROFESSIONALS WORLDWIDE

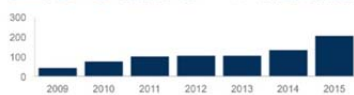
750 000 000+
COMPONENTS/PRODUCTS
CONTROLLED / INSPECTED / REWORKED // year
with average quality performance <5ppm

Permanent teams in
400
MANUFACTURING SITES
including 90+ final assembly plants

225+
QUALITY ENGINEERING PROJECTS // year
(SQD/SQA, audits, trainings, etc.)
including

50+ CROSS-BORDER
PROJECTS // year

200M+ € Annual Revenue



8000+ CUSTOMERS

65 000+
QUALITY CONTROL MISSIONS // year

Figure 1.2 TRIGO's Key Figures

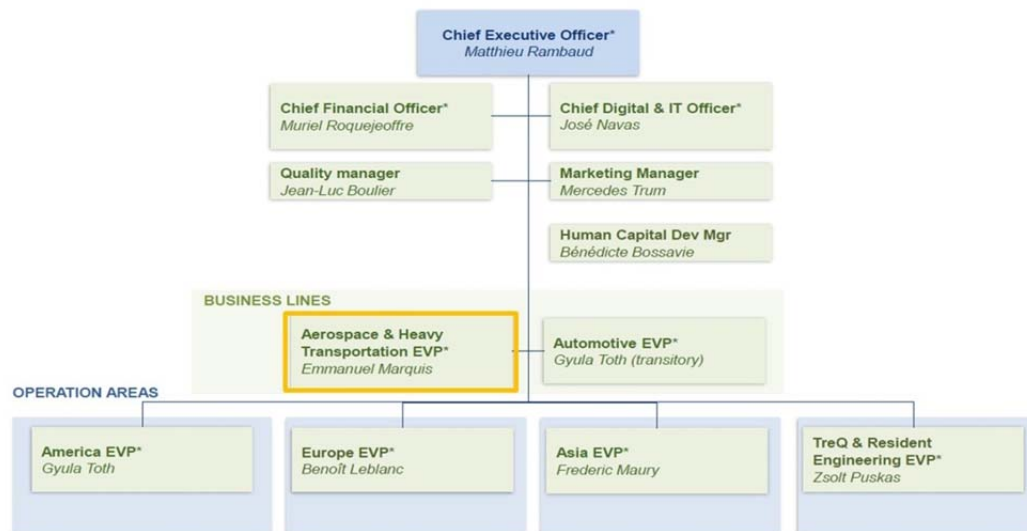


Figure 1.3 TRIGO's Organizational Structure

1.2 Problem Statement

TRIGO is the company has a strong global presence in 4 continents around the world in Europe, North Africa, Asia, and South-America. By considering these 4 continents, the company has had the footprints in 26 countries so far. Notwithstanding, it has been an inconsistency of policy in terms of the knowledge management to share best practices among the different strategic locations around the world. In other words, the information in terms of problems and solutions that has been gathered from one part of the world has not been shared effectively to all the others. Meanwhile, the company was aiming to expand the business into an aerospace industry which is the most profitable business line. As a result, an efficient knowledge sharing procedure is indisputably essential for the company in order to foster the global network to come up with the comprehensive quality solutions.

1.3 Main Goal/ Scope of the Project

Since there have been an inconsistent practices and inefficient knowledge sharing across the globe, therefore, the goal of this project is to provide the solution to augment the efficiency in knowledge sharing process.

Regarding the scope of the project, first of all, it is to propose a tool to implement internal customer knowledge management by

1. Accumulate knowledge after each mission, return on experience and lessons learnt.
2. Share day-to-day records and historical data inside the quality network globally.
3. Capitalize on previous experience for the benefit of TRIGO network and customers for novelty and innovation in terms of processes, procedures and services.

The proposed tool will be directly beneficial for 4 groups of people include:

1. Quality Consultants: They are those who are from TREQ department and they are responsible for the customers who require customized services apart from standard services normally offered by TRIGO. Basically, the mission of TREQ department is to deliver scalable and customized project-based solutions to individual quality challenges all around the world.
2. Business Managers: They are those who know business as a whole. So, they are responsible to develop quality business in new countries as well as identify and deploy new services related.
3. Quality Managers: They are those who manage quality inspectors and directly deal with customers to handle their requests. They implement the action plans. Furthermore, they are the people who decide the level of access to the data content for the quality inspectors and give the access rights to them.
4. Quality Inspectors: They are those who directly deal with problems at customers' manufacturing sites around the world in order to execute the work and provide the quality solutions for the clients. They usually perform their tasks according to orders task by task.

Secondly, it is to propose the newly invented customer knowledge management (CKM) model at the end of the day in order to guide the operational procedures within TRIGO in the future and also to enhance the consistency of policy to share the best practices globally.

CHAPTER II

LITERATURE REVIEW

This chapter emphasizes the significance of the completed processes regarding the customer knowledge management which will be applied to analyze the current problems as well as to guide the solution for TRIGO which is a comprehensive quality services provider. The information from this chapter will be applied to foster the analysis chapter as well as the recommendation chapter accordingly onwards.

2.1 Customer Knowledge Management (CKM)

Foremost, the researcher would like to begin with the definition of the knowledge management before continuing with other supporting ideas. Indisputably, there have been a lot of published definitions of knowledge management so far. However, there are some meticulous definitions that have been selected by the researcher and they are as follows:

“Knowledge management is a business activity with two primary aspects: Treating the knowledge component of business activities as an explicit concern of business reflected in strategy, policy, and practice at all levels of the organization; and, making a direct connection between an organization’s intellectual assets-both explicit (recorded) and tacit (personal know-how)- and positive business results” (Barclay and Murray, 1997).

“Knowledge management is the concept under which information is turned into actionable knowledge and made available effortlessly in a usable form to the people who can apply it” (Information Week, Sept.1, 2003).

Undoubtedly, the definitions of knowledge management can be given differently based on different perspectives. Whereas the first description is distilled from the business perspective, the second description provided inclines to be more process or technologically related. However, there are two general objectives which are typically

addressed by knowledge management, i.e. knowledge reuse for more efficiency, innovation for more effective ways of doing things.

Regarding the customer knowledge management (CKM) in this paper, it is about how to manage knowledge received from the customers so that the assembled knowledge can be useful in the future. In other words, it is about how to gain the return on experiences that have been accumulated from the customers so that those experiences can be deployed to foster the future missions of TRIGO.

Nonetheless, regarding the 2 kinds of knowledge, there are some obvious contrasts between the tacit knowledge and the explicit knowledge in terms of their properties. Actually, the tacit knowledge tends to reside “within the heads of knowers”, whereas explicit knowledge is usually contained within tangible or concrete media. In fact, tacitness is a property of the knower: what is easily articulated by one person may be very difficult to externalize by another (Dalkir, 2005).

Table 2.1 Comparison of Properties of Tacit vs. Explicit Knowledge

Properties of Tacit Knowledge	Properties of Explicit Knowledge
<ul style="list-style-type: none"> - Ability to adapt, to deal with new and exceptional situations. - Expertise, know-how, know-why, and care why - Ability to collaborate, to share a vision, to transmit a culture - Coaching and mentoring to transfer experiential knowledge on a one-to-one, face-to-face basis 	<ul style="list-style-type: none"> - Ability to disseminate, to reproduce, to access, and to reapply throughout the organization - Ability to teach, to train - Ability to organize, to systematize; to translate a vision into a mission statement, into operational guidelines - Transfer of knowledge via products, services, and documented processes

Source: Dalkir (2005)

By knowing the differences between the tacit and the explicit knowledge first, the researcher believed that it would be beneficial to point out the root cause of KM problems within TRIGO. However, it is undeniable that technology plays an important role to deal with the transition from the tacit knowledge to be explicit. These days, by writing help articles, know-how manuals, guides etc. in the knowledge

management tool that can be viewed by other employees, it can help experts to make their tacit knowledge explicit easily, and this can help in disseminating and re- applying the knowledge throughout the organization (4). This means that a knowledge sharing platform is a key factor to foster the stated transition to be successful.

After the differences of those two kinds of knowledge have already been identified, the researcher was interested in the processes of knowledge management in order to analyze the current TRIGO's process and apply the concept of the integrated KM cycle into the proposed CKM model in the recommendation phase. The researcher believed that it is crucial for TRIGO to have a systematic customer knowledge management process since the company has not had any concrete KM process so far. That is why the Integrated KM Cycle, the model that has been widely used nowadays, was introduced as a guideline as follows before inventing more specific and more detailed processes specifically for TRIGO in the last chapter.

This model proposed by Dalkir has been integrated from 4 major approaches include: Meyer and Zack (1996), Bukowitz and Williams (2000), McElroy (2003), and Wiig (1993). The reason that these approaches are selected is because they meet the following criteria:

1. They are implemented and validated in real world settings
2. They are comprehensive with respect to the different types of steps found in KM literature
3. They include detailed descriptions of the KM processes involved in each step (5)

Integrated KM Cycle by Dalkir

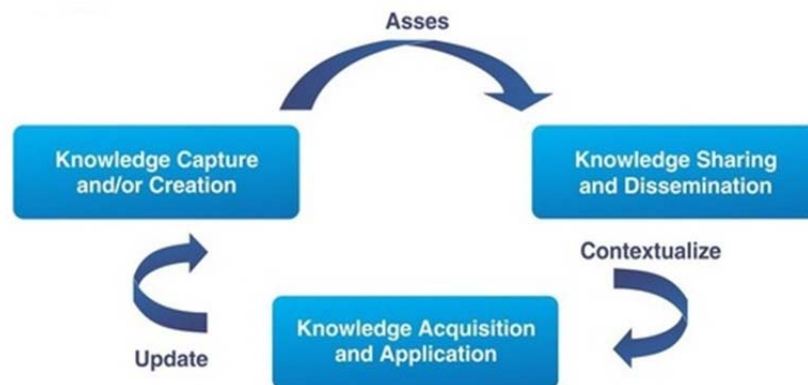


Figure 2.1 An Integrated KM Cycle

Source: Dalkir (2005)

An Integrated KM Cycle contains three major stages, i.e. Knowledge capture and/or creation, Knowledge sharing and dissemination, Knowledge acquisition and application serially. The transition from knowledge capture and/or creation to knowledge sharing and dissemination, knowledge content needed to be assessed. Knowledge is then contextualized in order to be understood (“acquisition”) and used (“application”). After all, the knowledge will be fed back into the first one in order to update the knowledge content (Dalkir, 2005). The researcher will describe the key concepts for each of the three major stages as follows:

2.1.1 Knowledge capture and/or creation

The first stage of the knowledge management cycle starts with knowledge capture and codification. In other words, tacit knowledge is captured or elicited, and explicit knowledge is organized or coded (Dalkir, 2005). Provided that the company can transform individual knowledge into organizational knowledge, the company will be able to gain a competitive advantage. Furthermore, the company will be able to compete more effectively in the future providing that an organization’s knowledge base coupled with the potential of individual skills, competencies, thoughts, innovations, and ideas are fully utilized. However, “the tacit knowledge may require much more significant up-front analysis and organization before it can be suitably described and represented” (Dalkir, 2005). Thus, this paper will not emphasize about how to tackle tacit knowledge

which have many ways range from simple graphical representations to sophisticated mathematical formulations which depends on each individual task. Contrarily, the paper will focus on the process to turn tacit knowledge to be explicit by applying the automated knowledge taxonomy method inside the KM tool. On the other hand, to communicate knowledge much more widely and with less cost, the knowledge needed to be converted into a tangible, explicit form such as a document through the knowledge codification which is the next stage of leveraging knowledge (Dalkir, 2005). Nonetheless, the proposed CKM model by the researcher in the last chapter was designed to enhance the knowledge creation process by considering this caption.

2.1.2 Knowledge sharing and dissemination

Once the knowledge has already been captured and created, it needs to be shared and disseminated throughout the organization. The company needs to create the Knowledge-sharing communities which are not just about providing access to data and documents but they are also about interconnecting the social network of people who produced the knowledge. A good knowledge management system should include information not just on the people who produced the knowledge but also on those who will make use of it. Furthermore, making the knowledge visible is one way to facilitate knowledge sharing. “Knowledge sharing can be made more visible by making the interactions online in some way” (Dalkir, 2005). Notwithstanding, “the organizational culture and climate may either help or hinder knowledge sharing. An organizational culture that encourages discovery and innovation will help, whereas one that nurtures individual genius will hinder. An organization that rewards collective work will help create a climate of trust, whereas a culture that is based on social status will hinder knowledge sharing. Without a receptive knowledge-sharing culture in place, effective knowledge exchanges cannot occur. Significant organizational changes may need to take place before effective knowledge sharing can begin to take place” (Dalkir, 2005). Here we can see main factors that can directly affect the effectiveness of knowledge sharing and dissemination which include the ability to create knowledge-sharing communities, the ability to make knowledge visible, and the ability to create an organizational culture that contribute to knowledge sharing respectively.

2.1.3 Knowledge acquisition and application

This is the final step in the knowledge management cycle after the knowledge that has already been created, shared is put to actual use. On the other hand, the actual use of knowledge that has been captured or created and put into the KM cycle is the knowledge application. “This is knowledge reuse, the process whereby useful nuggets of knowledge or knowledge objects are made available in a library of such objects. These knowledge objects can be annotated references, components (programs or text), patterns, or other types of containers” (Dalkir, 2005). The goal is to enhance the time reduction in completing tasks as well as the higher standards of work quality. Furthermore, the reuse of tacit knowledge will enhance a long-term advantage especially for those who need the advice of more experienced colleague. Besides, the explicit knowledge that are accessible to everyone will be useful for the company in the long run. Basically, “there are three major roles required for knowledge reuse: the *knowledge producer*, the person who produced or documented the knowledge object; the *knowledge intermediary*, who prepares knowledge for reuse by indexing, sanitizing, packaging, and even marketing the knowledge object; and the *knowledge reuser*, who retrieves, understands, and applies it. Of course, these roles are neither permanent nor dedicated- individuals will perform all three at some time during their knowledge work. Knowledge repackaging is an important value-added step that may involve people, information technology, or, as is often the case, a mixture of the two” (Dalkir, 2005). However, in order to facilitate knowledge application at the organizational level, a KM organizational architecture needs to be designed, developed, and implemented. Here we can see that the knowledge acquisition and application stage is principally about how to reuse knowledge in the system effectively to enrich the future missions of an organization. Moreover, it is about how to add value to the knowledge base by updating the knowledge content back to the cycle to enhance a continuous improvement of an organization.

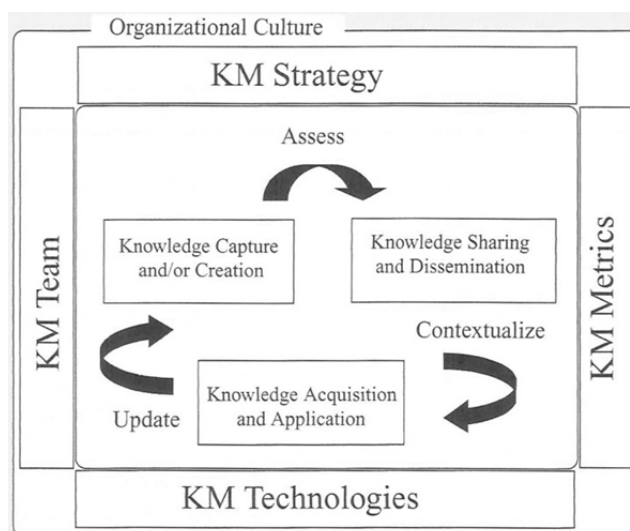


Figure 2.2 Complete Components In An Integrated KM Cycle

Source: Dalkir (2005)

According to the figure 2.2, there are 5 components that will enhance the success of KM in an organization. Those components include Organizational Culture, KM Strategy, KM Metrics, KM Technologies and KM Team respectively. In regard to an organizational culture, “implementation of knowledge management almost always requires a cultural change- if not a complete transformation, at least a tweaking of the existing culture(s) in order to promote a culture of knowledge sharing and collaboration” (Dalkir, 2005). Regarding the KM strategy, “it is a general, issue-based approach to defining operational strategy and objectives with specialized KM principles and approaches. The result is a way of identifying how the organization can best leverage its knowledge resources. Once this fundamental KM strategy is defined, baselining and technology options may be explored” (Dalkir, 2005). The organization will have a road map to identify and prioritize KM initiatives, tools, and approaches to support long-term business objectives once the KM strategy is defined (Dalkir, 2005). In addition, the organizational learning and continuous improvement can be achieved by having the KM strategy that provides basic building blocks so that the better ways of thinking and doing can be realized by everyone in order to not waste time repeating mistakes (Dalkir, 2005). Regarding the KM metrics, the assessment framework should ideally be included in the KM strategy to monitor progress of the targeted KM objectives

(Dalkir, 2005). Three commonly used techniques to assess the KM metrics include benchmarking, the balanced scorecard method, and the house of quality metric (Dalkir, 2005).

In regard to the KM technologies, diverse tools that come into play throughout the KM cycle are required for the knowledge management implementation. For better knowledge capture, sharing, dissemination, and application, the communication, collaboration, and content management are facilitated by technology (Dalkir, 2005). Towards the last component which is the KM team, “one approach to forming an effective KM team is to define the different types of KM professionals and the types of skills, attributes, and background they should ideally possess. The ultimate goal is to develop a list of cognitive, affective, and psychomotor skills together with the required competency levels for each skill” (Dalkir, 2005).

By considering this project proposed by TRIGO, there were 3 components which are regarded to be out of the scope for the project includes the organizational culture, the KM metrics and the KM team serially since the project had no focus on the implementation or the execution phase. On the contrary, the project focused on how to initiate the notion about the customer knowledge management for the quality inspectors network which mainly links to the KM technologies in terms of how to select the most appropriate tool for TRIGO. After all, the proposed CKM process related to the chosen tool will be used as a guideline or a starting point to navigate the KM strategy implementation in the future. In other words, this paper will be related principally to 2 components, i.e. the KM strategy and the KM technologies. However, the further development of the view on the support of the proposed CKM system will still be essential including other facets related to another 3 components that have already been described.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Steps of the Project

Regarding the research methodology, there were 4 principal phases according to the provisional planning proposed to the company since January 2017. Those phases include diagnosis phase, benchmarking phase, service standard offer definition phase, and recommendation phase serially. Nevertheless, each phase contains detailed steps to navigate the research as the following illustration.

3.1.1 Diagnosis

Steps:

1. Identify the notion of knowledge management
2. Analyzing current TRIGO processes and internal needs through:
 - the interviews with TRIGO employees
 - internal documents
3. Examining the existing tools currently used by TRIGO

3.1.2 Benchmarking

Steps:

1. Defining the criteria for the tool based on TRIGO needs
2. Searching for the existing solutions used by the competitors
3. Analyzing pros and cons of the solutions identified
4. Selecting the best possible solution for the company

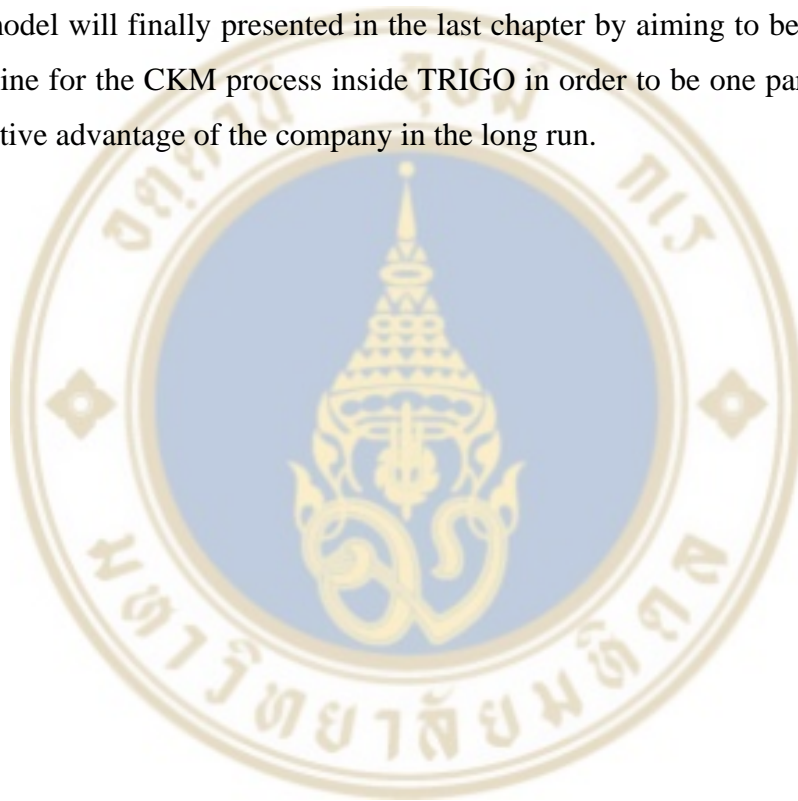
3.1.3 Service standard offer definition

Preparing a standard sales offer for the potential customers explaining the benefits of the chosen tool

3.1.4 Recommendation

Providing recommendations for the tool implementation as well as proposing customer knowledge management (CKM) methodology for TRIGO

By the way, these are the steps presented by the researcher in this paper. However, the theoretical analysis was also applied in the diagnosis phase to analyze the interview results from the interviewees who have been interviewed. Moreover, the framework provided in chapter 2 was applied as a guideline to find the appropriate solutions to fill in the gap. By following this research methodology, the proposed CKM model will finally presented in the last chapter by aiming to be implemented as a guideline for the CKM process inside TRIGO in order to be one part to enhance the competitive advantage of the company in the long run.



CHAPTER IV

DATA ANALYSIS PHASE 1 (DIAGNOSIS OF CURRENT TRIGO'S PROCESS AND INTERNAL NEEDS)

4.1 Introduction

In the frame of Internal Customer Knowledge Management (CKM) project, the four main milestones were identified: diagnosis of current TRIGO process and internal needs for KM, benchmarking of existing solutions, preparation of service standard offer for the selected KM tool and recommendations for its implementation. The main goal of the project is to propose a tool that will facilitate the capitalization on previous experience for the benefit of TRIGO network and customers by accumulating knowledge and methods employed that can be beneficial for future missions.

This chapter presents findings for the first stage of the project and gives an overview on the current existing KM tools and internal KM needs which were identified during interview sessions with TRIGO employees. The interview questions were classified in four main topics: scope of activities of TRIGO representatives, current KM tools used by the teams, the description of ideal KM tools and implementation perspectives respectively.

After finalizing the interview sessions, all answers were gathered and synthesized in the comparison table highlighting the similarities and the differences in KM practices mentioned by the interviewees. The table is illustrated in the Appendix C.

The analysis of existing KM practices and problems discussed with the interviewees will facilitate the decision-making for the new KM tool. Understanding current requirements from TRIGO employees could help us find a new KM solution that could better fulfill the needs of the users in the future. The results from the diagnosis phase will foster the benchmarking process in the next phase as well as will contribute to the last phase of the project dedicated to the new KM tool implementation in TRIGO globally.

4.2 Objective

The main objectives of the diagnosis phase include:

1. Identifying the roles of the interviewees and their scope of activities
2. Analyzing current TRIGO processes and related KM needs
3. Examining the existing tools currently used inside TRIGO globally
4. Identifying the characteristics of the ideal KM tool
5. Implementation practices of IT tools in TRIGO

4.3 Interviewees

There four main target groups that were identified for the project: quality consultants (TREQ), business managers, quality managers and quality inspectors (residents). TRIGO employees from first three groups were invited for the interview sessions representing aerospace, automotive and heavy transportation industries.

TRIGO employees participated in the interview sessions include:

1. Interviewee 1

Role: Global Resident Engineering Service Manager (TREQ)

Industry: Aerospace, Automotive and Heavy Transportation Business lines

2. Interviewee 2

Role: International Sales and Key Account Manager

Industry: Aerospace and Heavy Transportation Business lines

3. Interviewee 3

Role: Change Management Project Manager

Industry: Automotive Business line

4. Interviewee 4

Role: Quality Manager

Industry: Automotive Business line

5. Interviewee 5

Role: Director of Aerospace and Business Development in North America

Industry: Aerospace Business line

6. Interviewee 6

Role: Contract Manager for U-Shin project

Industry: Automotive Business line

7. Interviewee 7

Role: Project Manager for Stream5 project

Industry: Aerospace Business line

8. Interviewee 8

Role: Contract Manager for Stream5 project

Industry: Aerospace Business line

4.4 Existing KM tools at TRIGO

During the interviews, six main KM tools exploited in TRIGO were mentioned: SharePoint, Transnat server, Confluence, Google Drive, OneDrive and Customer Web Portal. The main type of data shared through the tools include invoicing, accounting documents, training materials, case studies, reporting and templates for preparing reports, dashboards and database files.

There is no a distinguishing line between contributors and beneficiaries of KM tools today. The list of users includes quality managers, quality consultants, business managers, shared services (like Marketing, HR, etc.), quality inspectors (residents) and freelancers. The last two groups of users in most cases have a limited access to data. It is the quality manager that decides what inspectors should know to be able to execute the work for the client. The opinion about the importance of keeping different level of access for different user categories is prevailing.

4.4.1 SharePoint

SharePoint is the only KM tool that is accessible by most of the quality network teams in Europe. It is a web-based application that integrates with Microsoft Office. The tool was introduced in TRIGO by an external provider, however, today is mainly managed internally by IT department of the company. Some TRIGO quality managers have the administrator access right, which means they do manipulations on

the platform by themselves. They design the architecture of SharePoint and give access rights for quality inspectors.

SharePoint main functionalities are dedicated to document management and storage system. Yet, the product is highly configurable and its usage varies inside the company. Inside TRIGO SharePoint, there are different sections dedicated to different business domains (automotive, aerospace industries) and different functions (Finance, Quality, TREQ, etc.). Some of the teams are using SharePoint to exchange documents dedicated to a specific project on a daily basis. Others use SharePoint very rarely. One of the reasons for that is the fact that historically some of the subsidiaries used to work with different KM tools and they continue doing so.

There is a trend of using different business applications for SharePoint. Red Daily Report can be a good example. This application was initiated by U-shin contact manager and was developed by a group of students to facilitate reporting preparation. The main goal was to provide ready-made forms that had to be filled in by quality inspectors and then this data was generated into a PDF document. It helped to reduce the time and effort spent for report generation, which was done previously with Microsoft Excel. Moreover, Excel document format is not practical for smartphones, so PDF documents bring additional value. Another example of a business application used by TRIGO employees is Yammer. The main functionality of this application is to streamline communication process inside the organization. In this interactive tool, employees can set up conversations around documents or projects happening in the company which are more open based conversation compared to emails one to one. People can create and join groups related to a specific topic and during conversations share on documents, images, making polls.

However, there are some issues related to the use of SharePoint mentioned by the employees. Today TRIGO SharePoint represents an old-fashioned way of managing information by using stand file directory system with folders dedicated to a specific topic. Even though SharePoint has more search capabilities than hard drive systems, however, it is still hard for employees to find documents inside. Without knowing in which section you need to search, it is not evident to seek for the right document. Another problem is the reactivity of SharePoint. As it is a web based platform, the tool speed depends on the Internet connection, which is sometimes very slow in some offices. It

makes it even more challenging since the whole team is usually sharing the same document, and if the tool is not responding well, some changes made inside the file may not be registered. Finally, there is limitation in terms of the storage space accessible in SharePoint. The data is stored on external servers, so in order to increase the storage space size, the additional investments are required. In addition, SharePoint still cannot allow automatic update by itself. Employees have to spend some time to ensure cleaning” of the files, meaning that all the documents are up-to-date, that there is only the last version uploaded, which require much manual work. So, the platform is good for exchanging up-to-date documents, but has some limitation for the storage of data.

4.4.2 Internal servers (hard drive network)

Transnat is an internal server that is used mainly by quality managers and quality consultants. The server is fully maintained by IT department and is used as an alternative solution for SharePoint to compensate for its storage limitation. Furthermore, managers tend to share sensitive and confidential data through Transnat server rather than through SharePoint. Server can be accessible only by connecting to the internal network, so it is believed to be a more secure. As it does not require internet connection, it excludes problems related to bad internet connection.

Despite being a more reliable tool, it represents a very primitive way of sharing data. With a file directory system of storing data, the server has very limited functionalities. Search capabilities are very low so that makes it difficult to look for the documents. Comparing to SharePoint, access rights to the folders are given by IT department, so it take some time to get access to the documents. Moreover, there is no much flexibility in terms of different groups of users having different level of access rights. Another issue is the absence of modification history. Once the file is updated, it is difficult to restore the previous version. Since the server can be accessed from only from inside, it can't be used to share data with outsider.

4.4.3 Confluence

3 years ago a Knowledge Management project was launched by one of the quality managers in TRIGO with a goal to collect quality data from different TRIGO countries and operations to implement a global toolbox. As a result, Confluence wiki

software was chosen for the project realization. The platform represented an internal sharing portal with its dedicated library and categorized sections such as “Know-How” and “How-To”. The data was classified into several sections of the library, each section is referenced by a release date, a unique file ID, a file name describing the nature of the document and field of activity. However, the platform encountered some difficulties. One of the limitations included difficulties with data mapping, searching by keywords and navigating efficiently inside a file within high number of languages used for the documents. The idea was to prepare standardized templates and to convert all documents into English language to make it readable for all employees inside the company. However, some document had thousands of pages, which required a lot of work.

Later, the “Know-How” was replaced by Case Studies tool based on the same wiki platform Confluence. Today Case Studies system is managed by Marketing department, who keeps it up-to-date and continuously refreshing. The tool is currently used only by few employees, mainly coming from Sales department. The data for Case Studies comes from Marketing, Sales and Engineering departments, however, not all employees are aware of the existence of this platform. After receiving the data, Marketing department prepares templates in and share it with the teams through Confluence. Cases studies are shared only internally, and TRIGO managers decide what to share or not with the client.

Case Studies is a well-structured and well-formulated content where it is possible to find information about which methodology was used for the project, country, project key figures and achievements, points of contact, etc. Marketing department ensures that templates are following the standard structure and are written in English. It is easy to search for the templates and navigate on Confluence platform. Nevertheless, the platform is mostly used for storing data. It is not possible to edit Case Studies online as well as documents in the format Word or Power Point. In order to be able to edit files, it is required to create document in the special Confluence format.

4.4.4 Google Drive & OneDrive

Google Drive and OneDrive are the two freemium cloud storage systems used by some of TRIGO employees. The two tools are used in most cases as an alternative to SharePoint. For example, currently Google Drive is used for daily operations and

referencing issues for U-Shin project. Even if SharePoint is established, few U-Shin project team members use it on a regular basis, therefore data remains outdated. One of the reasons for that is the fact that a few quality residents have limited access for SharePoint. As a result, the residents are more familiar with Google Drive than SharePoint and found it more complicated for the usage. Moreover, Google Drive is quicker than SharePoint in terms of downloading or uploading speed. Even if the recent trend is the increasing spread of SharePoint inside the company, the time spent on transferring documents on SharePoint is one of the factors that makes the transition undesirable. Google Drive remains a more preferable tool.

Nevertheless, there is number of drawbacks mentioned by the users of Google drive. The tool does not fully support Microsoft Office functionalities, and for instance, some sophisticated formulas are difficult to implement in Excel. Like in SharePoint, there are storage space limitations meaning that an ongoing cleaning of files is required. Another important limitation is an absence of alert notifications, which is a significant drawback of the tool as it does not allow the resident managers to ensure that residents check the new documents or guidelines by themselves. Finally, the fact that Google Drive is blocked in China means that the system cannot be used by all employees in the company.

4.4.5 External communication

Apart from existing internal KM tool inside TRIGO, the systems for external communication, particularly with clients, should be taken into account. Customer Web Portal is the platform internally managed by TRIGO and used to share data with customers. It enables easy interaction with customer on ongoing assignments. Yes, in a very restricted manner. Customer Web Portal is very tricky because due to the huge information that could be made available to customers, there are confidentiality dilemmas, the biggest challenge from an IT perspective is to impose restricted access.

However, not all clients receive data about their projects through Customer Web Portal. Some big customers prefer to use their own IT tools and they require TRIGO to input data directly to their system. A good example can be Ishare in Airbus used by Stream5 team as a platform for sharing data with the aircraft manufacture. Yet, in order to access the system, the team should be physically present at Airbus site and have access

to the system of Airbus. By contrast, Airbus does not have access to TRIGO SharePoint. One of the drawbacks of inputting data through external tool of a client is the fact that this data is not recorded internally by TRIGO, and teams based in other regions, for instance, in North America, do not have access to it. This means no experience sharing and lessons learnt are not possible.

4.5 Constraints

Today in TRIGO there are many different KM tools used across the company. One of the main reasons for that is the constant growth of the company through ongoing mergers and acquisitions (M&A) process. Newborn subsidiaries tend to keep their KM tools from the past, so with every separate M&A, a separate data management system comes. A good example can be PICO SharePoint in North America and TRIGO SharePoint in Europe. Both tools belong to the same type of IT product. However, due to the historical reasons (acquisition of PIC Group by TRIGO) PICO SharePoint is not linked to TRIGO SharePoint.

Currently there is no a common established system to manage data globally inside the company. As a result, there are several KM tools that exist in TRIGO nowadays that have the same functionality for document management and storage system, which leads to the decentralization of KM practices and prevents users to share data across different departments and business units around the world.

Another constraint is there are many foreign languages used for documentation. Despite the fact that the official language of the company is English, employees are still using their local language, which makes it difficult to share material with other regional teams.

Apart from language differences, there is also an inconsistency in hardware systems generations used in different regions of TRIGO. This is a problem not only for internal data exchanging, but also for the external data sharing. Big customers tend to have the latest hardware systems, which means that if the file was created in Microsoft Excel 2013, for instance, manipulations with the file will be restricted when using Microsoft Excel 2007, which is the case today for North America.

Finally, different IT users proficiency levels supported by the lack of training for KM tools usage results in the restricted ability to exploit existing systems. The majority of the interviews admitted that SharePoint is a very complex tool for the usage, and its full potential cannot be used today due to the low level of awareness of its functionalities.

4.6 Ideal KM tool

The researcher asked each of the interviewees to describe what would be for them the ideal knowledge management tool if it was to be deployed on a company wide scale. The researcher was able to recognize convergent aspects that most participants expressed as well as more or less divergence. For instance, in some cases, their expectations in terms of the tool capabilities and goals are beyond what we can consider traditional knowledge management tool. The researcher considered those specific requests that were often linked to specific position, field of activity and responsibilities as advanced features. Since this project is about the consolidation of data within TRIGO, a possible approach would be to incrementally complement the system's features to benefit all users in the long term.

4.6.1 Common ideals & features

The over-all aspects of the ideal knowledge management tool were shown to be quite similar among interviewees. At the core of the tool, the researcher can safely state that the same guiding principles were sought to fulfill the basic need of having access to past accumulated knowledge. 4 keywords are referred to as pillars: simplicity, efficiency, flexibility and interactivity.

1. **Simplicity:** in the sense of promoting user friendliness for both contributors and beneficiaries thus permitting effective implementation on a wide scale. The tool should be intuitive with the least number of manipulations needed for its day to day use.

2. **Efficiency:** as an autonomous, easily accessible and reactive platform, which enables time saving, value adding and greater performance.

3. **Flexibility:** as one unique tool, would preferably interconnect multiple type of employees with distinguished functions and responsibilities while giving them the possibility to personalize their user experience.

4. Interactivity: most of the knowledge will still be sourced from individual's experts, as the quality field is ever changing, it is important to interconnect employee so they can provide for each other.

4.6.2 User Experience

1. Different level of access: Knowing that the researcher mentioned the diversity of the users on this ideal platform, it was clear that the majority of the interviewee expressed the need for different level of access. Some managers pushed for exclusivity for certain actions. Some brought forward the idea that the inputs should only be made by team leaders after group consultation, for example, to assure the quality of the submitted data. Restricted access seemed to be very important for many of them as they pushed the argument that user should only be able to navigate files that are directly contributing to their missions.

2. Multi device accessibility: Since there is a wide range of devices used at TRIGO both within the offices and on the fields, it is important to maximize the compatibility of the tool with most devices such as computers with not only windows operated systems but also Mac iOS. For remote access during missions, on a smartphone side, it should ideally support Android and Apple. Furthermore, in order to assure convenient access, an online web based version should be available.

3. Automatic alert: In order to engage users, instant notifications regarding what is currently relevant to them should be a provided feature on the platform. By being automatically alerted, users will see the interactive benefit of the tools. Therefore, they will be reminded to visit it regularly, to contribute to others need as there will be a sense of urgency involved. Automatic alert shows that users are reactive, dynamic and that the system is constantly updating.

4.6.3 Content

1. Wide range of formats: The tool should be able to support a wide range of formats from documents, to pictures and even databases. The more formats supported the better as this would imply that the tool would be adaptable to further evolution in knowledge management requirements. Microsoft office integration is a must, along

with the capability to edit directly the files on the platform without having to download and re-upload the edited version.

2. Support for all activities: Since the aim is to consolidate information, all activities held by TRIGO should be supported, including the so-called “side lines services”. Furthermore, all functions of the company (HR, marketing, finance, management) will find benefit in a consolidated tool, transparency of data is beneficial for overall performance. As mentioned earlier operational data will also have its place with results, processes for clients, frequent issues, etc.

3. Library auto-version: The stored data can take up the form of a categorized library with section such as training modules, best practices, past invoices, etc. To be efficient, a feature to facilitate management of versions should be included in the platform, this will ensure that the files are always updated, if not the last author of the document may also be identified for follow up.

4. Security: When sharing on a company online platform, the data safety can be tricky, it can be very difficult to control the content shared by the users. Data encryption is a necessity because the mistakes can happen even when there are required authorizations to open the data. Sharing of sensitive data such as sales, price and budget information require confidentiality and high level of data safety.

4.6.4 Tool management

1. Storage space: It is evident that the storage space must be sufficient to accommodate the data on a day to day workflow basis. This calls for a fast upload/ download speeds whichever the point of access, inside or outside the company. Moreover, high speed is important to ensure the reactivity of work thus the usability of the tools. As mentioned above with the multi device accessibility, this storage space should have online access.

2. Centralized system, standard procedures & identifiers: The ideal tool would break the current segregation of data into multiples tools which make exploitation difficult. The software itself is important, however what is even more important is the support system built around the tool. By having a centralized support system, all of the inconsistencies would be resolved. It is crucial to appoint a formal authority that will be in charge of standardization on a global scale, to ensure that official procedures are

implemented, and to act as a focal point in case of need. Since TRIGO has its unique processes that may be different from the market, the idea would be to develop common set of identifiers for the data. However, in case of needs, there should be flexibility for these identifiers to be easily adjusted to fit the customer's procedures as well.

3. Templates to fill-in online for data generation: One of the functionality was to provide for the platform a section where users could find a wide supply of ready-made templates to be filled in order to directly export them as standardized inputs. In order to facilitate data input, ready-made templates for each type of category of data would be available. In some missions, one specific individual is specialized in one aspect of the mission, controlled access to modify certain area of the template could be relevant to assure quality of the information. Hopefully, the template based input will stimulate users as it will facilitate their effort of contribution. Indeed, on an operational level, standard processes should be elaborated to effectively switch theoretical data into usable data on the fields for the workforce.

4.6.5 Categorization

1. Standard & customized to each user type: Since all the users have their respective responsibilities and on ongoing projects having a personal space on the platform is required. A personal space would make the categorization flexible to their need as well as the need of their teammates. The whole platform will have a standard categorization in order for user to easily find data that they can arrange by themselves on their personal area with their own criteria adapter to their functions.

2. Some suggested categorization: The researcher was suggested many different types of categorization that can all be included to have a complete indexing that can be used for different company function:

3. Mission type competences (e.g: Welding, Assembly, Painting, etc.)
4. Nature of activity (e.g: Audit, Control, Marketing, Training, etc.)
5. Others, the current one in TRIGO (e.g: industry, customer, supplier, product, defect type, etc.)

4.6.6 Advanced Features

What really diverged among the responses was rather the extent of the tool capabilities beyond the traditional vision of a basic KM tool. Expectations varied more or less according to the needs of the respondents which was expressed by additional features that weren't necessarily expressed by other interviewees. However, with some hindsight, the researcher may as well assume that these extra features may complement the envisioned system thus resolving issues encountered by all users which is the purpose of having a consolidated tools fitting everyone. Those extra features could be added incrementally to gradually complement the platform. Of course, the challenge remains to trace limitations, to judge where adding an extra feature would compromise to the 4 initial pillars.

1. Human Resources aspect

Some managers expressed a need to include a human resource aspect to the tools. At first sight this may seem out of the scope of the traditional domain of the knowledge management. Yet, if you come to think of it, people in the organization are the one who possess the skills, competences and capabilities. So, in a way they should also be coordinated on an operational level.

By providing awareness of human resource within the global network, articulating teams based on their know-how on a worldwide scale would be possible to efficiently fulfill assignments. One proposal was to reference all the employees in one massive data base where they would be identified based on their set of skills, areas of expertise, work location and contact details. Some success stories regarding these practices of global expatriation were already encountered many times before in the automotive business line where German engineers were sent to collaborate with local engineer in Asia to solve a specific issue that required western automotive expertise. This is a very promising practice to develop.

To continue, another idea was that the platform would empower the available manpower by providing the required practical learning materials that would contribute to their training. Therefore, transforming the raw theoretical knowledge into a pragmatic usable state was really pushed by some managers. This would also enable consistency within the workforce, reducing dependency on specific individuals, in case of leave

someone else could assure the function, thanks to the available learning materials, feedbacks and records regarding ongoing missions.

2. Internal Communication

Adding a communication feature on the tools is like facing a dilemma, on one side it may compromise the principle of simplicity. Yet on the other side, it may contribute in terms of efficiency and flexibility. The researcher is well aware that the ideal tools should be autonomous, of course, when it comes to managing the whole system, this may be too optimistic from an information technology perspective: software's are yet to reach that level of perfection, human intervention is unavoidable, the idea would be to limit it as much as possible. When looking at the complexity of the activities that TRIGO is involved in, we can anticipate that contingencies are part of the field, preparing for the unexpected via prevention has become a usual process. Therefore, many participants emphasized on the need for intra-platform communication to have a viable tool on a long-term perspective. In other words, communication within the platform would allow users to stay committed by being more responsive, contributing in keeping the data updated as the user in need would let them know of the urgency.

3. Managerial Decision Making

In the form of a dashboard that would consolidate figures in order for managers to have a global view of what is happening within TRIGO. Based on the inputted data, the system would ideally produce KPI's reports illustrated by graphs and charts that could directly be exploited by managers for their day to day decision making. To continue on a business development perspective footprints of TRIGO businesses based in countries they have worked for, for specific client they are engaged in or even for specific cities and clients. These footprints are necessary to determine the maturity of certain geographical regions and would be crucial for business development decision making.

4. Customer Relationship Management

On a sales perspective, data regarding customers is highly valuable. Account manager and sales people should be able to have information on client relation history such as the problems and complaints encountered in the past. Using CRM baseline could be a good idea, this is where you start having the conversation with your customer. As a sales manager, having the possibility to transfer data about customers to operational

managers through such a system is crucial, so that they could better deliver the services for the customer at the end of the day.

4.7 Implementation of the tool

Here are the main implementation steps presented within TRIGO:

1. Beta version Testing (tool adaptation for tool usage inside the network)
2. Pre-launch communication, to reassure by emphasizing on user benefits
3. Establish support system around the tool (centralized and standardized)
4. Provide in depth training to assure mastery before dissemination
5. Select appropriate country pilot for each user profile
6. Cascade expansion starting from IT experienced countries

In this section, the researcher will develop by covering topics such as incremental approach, change management and the strategies for implementation process.

4.7.1 Involved actors, support and sponsoring

When introducing a new tool or new functionalities it is mandatory to ensure its smooth implementation. It is undeniable that all the relevant stakeholders have to deal with the change management, these includes of course the contributors and beneficiaries of the future tool.

Preparing a roadmap can be an efficient way to envision the transition to the new chosen tool or updated version of existing tools. Technical aspects such the support system for the tool which is mainly about human aspect in terms of the people who are responsible for the data management and the data sharing is essential. There are many aspects such as the updates of documents, types of shared data, linked quality management process. After finalization, these information can be shared transparently to promote trust, confidence and engagement within the organization while focusing on what will be the interests for stakeholders to use this particular tool.

Similar to a business plan, the roadmap will be used to convince stakeholders internally. As in any lucrative business, financial aspect are priority, knowledge management tools represent consequent investments meanwhile their contribution to revenues cannot be directly measured or even guaranteed. Which is why presenting all the benefits of

this kind of project is vital to its long term success. Sufficient support and sponsoring from the upper management is a first priority. Upper Management wants to be reassured regarding the risks, a solid change management strategy is one of the convincing argument.

4.7.2 Centralized and standardized

Notwithstanding, there were different point of views from the interviewees towards the strategic notions of KM tool implementation, this gives a taste of the coordination challenges. Although some different views can be considered as complementary, we can imagine how tiny divergences can negatively affect effective standardization of practices on a global scale.

Past experience with Antifog going from version 1 to version 5 shows the change momentum relative to IT already present within TRIGO. Success relies on a meticulous testing process followed by a cascade approach to spread in selected countries while being supported by dedicated pilots to accurately guide local users in the transition. It is evident that the more people involved the more inertia will build up, of course this dynamic movement should be organized with a centralized focus point.

The transition is led by local catalyzers, which at TRIGO are the Country Pilots. They play important roles to smoothen the daily operations as well as to maintain the consistency in terms of the company policy regarding the knowledge management area. They will be the one administering the training locally, an essential step for staff to ensure that they will be able to apply the tool correctly and effectively to contribute to their daily operations. Moreover, pilots for each user profile can be chosen, and then the expansion can be cascaded to other countries on a step by step basis. This scenario will reinforce consistency of the company's policy about the tool implementation across different business units and internal departments.

4.7.3 Evaluation, feedbacks and adaptation

The IT tool does not need to be perfectly completed at the very beginning of launching. Contrarily, the beta version can be tested first. This can be pursued as an incremental approach. In other words, functionalities can be gradually added. Two way communications, in the form of feedbacks is a significant factor to foster the improvement of the tool. For instance, salespeople could insist regarding the development of the tool

towards Customer Relation Management, to use operational data for sales and marketing purposes. In this case, the exploration on the possibility of adaptation with customers IT tools should be considered. This is an illustration among other of how to widen the scope of the knowledge management tool on an incremental basis. Provided that more stakeholders can benefit from the tool, more links between company function will be built thus enhancing the effectiveness of knowledge sharing.

To guarantee a successful implementation of the tool, an adaptation of the processes for the tool usage inside the network is necessary. This will help making the system live together with a parallel challenge of deploying the tool. In software development, a big problem is the scope creep. Incrementally, progressive development and implementation which responding to different customer needs will pay off. Yet, the baseline for inspectors and customer platform system should be there for the initial release.

4.8 Theoretical analysis and conclusion

By considering the 2 kinds of knowledge, it is obvious that TRIGO has not had dominant problems about how to capture tacit knowledge. There are numerous quality control missions each year which means that each individual has a lot of opportunities to learn. Nevertheless, TRIGO still lacks of the ability to disseminate, to reproduce, to access, and to reapply throughout the company. On the other hand, the explicit knowledge have not been shared properly inside the company and it is a cause that hinders a continuous improvement on a whole. As a result, TRIGO cannot have an efficient transfer of knowledge through the quality control services today.

Referring to the integrated KM cycle and considering 3 major stages include: Knowledge capture and/or creation, Knowledge sharing and dissemination, Knowledge acquisition and application serially, it appears apparently that TRIGO is facing some troubles regarding these 3 stages as a result from an inconsistency of the KM strategy as well as the KM technologies in global scale. The researcher will analyze the current problems from the interview results regarding each stage as follows:

1. Knowledge capture and/or creation problem

Referring to Dalkir, "Competitive advantage is to be gained by making individual knowledge available within the organization, transforming it into organizational

knowledge.” By considering TRIGO’s current situation, it is obvious that the individual knowledge cannot be available or transformed into organizational knowledge effectively as a result from the incompatibility of the KM tools as well as the KM practices in different subsidiaries. One reason probably comes from the ongoing mergers and acquisitions of the company as we can see in the figure 4.1.

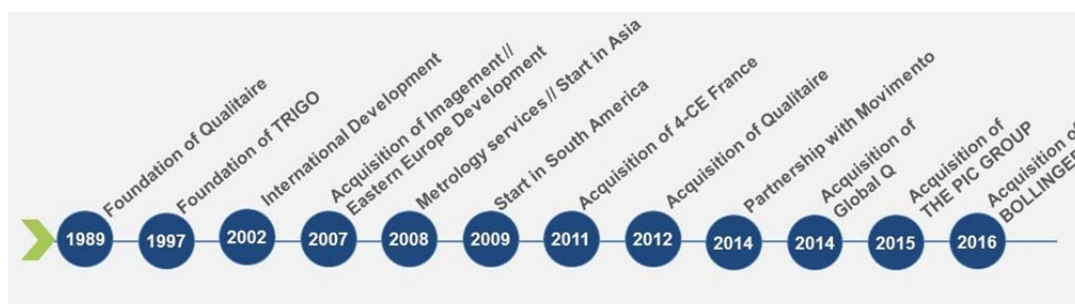


Figure 4.1 TRIGO milestones

As a result from the M&A, each office inclines to keep its own KM practices. Therefore, the explicit knowledge that have been created in one office or one region may not be understood by other offices in other regions. As a result, the company faces a knowledge creation problem since the continuous improvement cannot be developed from the existing knowledge base of the company. On the contrary, the explicit knowledge has been codified and developed in the different directions for the different offices. This fact finally leads to the divergence of the KM practice globally. However, this kind of problem is not only related to the tool itself, but is also related to the human aspect that the company may need to apply the change management to enhance the utilization of the company’s knowledge base to make company competes more effectively in the future. Considering 3 principal industries include an automotive industry, an aerospace industry and a heavy transport industry, TRIGO has more than 65,000 quality control missions annually. Providing that the knowledge that are accumulated from these missions can be utilized thoroughly, it will be beneficial for the company in the long run.

2. Knowledge sharing and dissemination problem

In regard to the normal practice considering the knowledge sharing within TRIGO, the knowledge contents are assessed firstly by the quality managers before

sharing to the quality inspectors who will have different access rights based on different individuals and different tasks. Nevertheless, the different KM tools and practices still cause a lot of problems in knowledge sharing and dissemination across different regions.

In regard to the knowledge sharing and dissemination problem, the researcher will analyze the main factors that can cause this problem, i.e. the ability to create knowledge-sharing communities, the ability to make knowledge visible, and the ability to create an organizational culture that contribute to knowledge sharing respectively.

Regarding the first factor that is the ability to create knowledge-sharing communities, it is undeniable that each subsidiary tries to create their own knowledge-sharing communities in many ways. Some of them even try to develop their own KM tools to serve their own interests. For instance, There is one application which is the Red Daily Report application that has been initiated by the contract manager to facilitate report preparation and use specifically for U-Shin project. However, TRIGO still lacks of the ability to create the knowledge-sharing communities across subsidiaries. The Knowledge that have been captured and codified in one office cannot be shared and disseminated thoroughly to other offices as a result from the different KM tools that hinder and cause the problem.

Regarding the ability to make knowledge visible, it is indisputable that the company currently lacks of the ability to make knowledge visible since the knowledge that have been created from one place cannot be detected in another place. For instance, the quality inspectors in Europe cannot know what is going on in America regarding the knowledge that have been gathered from the quality control missions. As a result, the quality inspectors in Europe may need to start from the beginning to find the solutions when dealing with the same problems that have already occurred in America instead of applying the same solutions that have already been discovered and proved.

Regarding the last factor which is the ability to create an organizational culture that contribute to knowledge sharing, it is indisputable that this factor can be considered as out of scope of the project. Yet, it is another factor that plays significant role to determine the success or the failure of knowledge sharing within the organization. Especially, for the global company like TRIGO, there are numerous challenges, e.g. the language barriers, the cultural barriers and so forth. Therefore, TRIGO needs to find the way to create the corporate culture that can compromise the KM practices as

well as can be acceptable for everyone in the different places. Currently, TRIGO has just had the notion recently that the company should have efficient knowledge management. But, the company still has not had any notion regarding the corporate culture which is one part that should be taken into account. On the other hand, TRIGO still lacks of the ability to create an organizational culture that contribute to knowledge sharing. Therefore, the notion to create the corporate culture that enhances the knowledge sharing should be initiated by the strategic levels to foster the knowledge sharing and dissemination within the company in the long run.

After all factors have been analyzed, it can be obviously seen that TRIGO is facing a lot of challenges that hinder the effectiveness of knowledge sharing and dissemination within the company. However, the researcher believes that the proposed solution in this paper will be one part to diminish the problem.

3. Knowledge acquisition and application problem

As the goal of the knowledge acquisition and application is to reduce the time it use to complete the tasks and to maintain higher standard regarding the quality of the work to be done, this stage of knowledge reuse is not less important than the 2 previous stages. However, since the explicit knowledge that have been codified cannot be shared and disseminated within the company efficiently, the knowledge reuse cannot happen presently inside TRIGO. Even though, there are a lot of *knowledge producers* which are the quality inspectors who deal with more than 65,000 quality control missions a year, they are still performing the different practices since the knowledge production is not compulsory inside the company. As a result, the knowledge base of the company is not updated and not ready to be reused in other missions. The quality managers and the marketing department can be regarded as the *knowledge intermediaries* because they are responsible to prepare knowledge for reuse as well as marketing the knowledge object. Nonetheless, most of the knowledge received from the upstream are outdated. So, they cannot prepare the updated knowledge for the reuse purpose in the next missions. As a result, the *knowledge reusers* who are mainly the quality inspectors, but also include people from TREQ department, the business manager, and even the quality manager themselves cannot reuse the updated knowledge at the end of the day.

In other words, the knowledge cannot be contextualized in order to be understood (“acquisition”) and used (“application”) properly by the subsidiaries in the

different regions. As a result, they cannot update the knowledge content by feeding back into the first stage. After all, the outdated information in the database can make the stakeholders incur some mistakes at the end of the day in case they retrieve those information to support their daily operations.

In addition, the suitable KM architecture has not been designed within TRIGO. Even though TRIGO has the well-established tool which is SharePoint but still lacks of the support systems around the tool. That is why there are a lot of obstacles remain not only about how to reuse the knowledge effectively, but also about how to add value to the knowledge base in order to enhance the continuous improvement in the long run.

Referring back to the figure 2.2 by considering 2 components in the scope of this project, there have been obvious problems related to both the KM strategy as well as the KM technologies. Regarding the KM strategy, TRIGO has never had any concrete strategy regarding the knowledge management. As a result, the subsidiaries have been in the different directions considering their KM practices. Regarding the KM technologies, since there is no imperative rule to force subsidiaries to apply the same approach worldwide, that is why the diversification regarding the KM approaches as well as the knowledge sharing problem still exists. In order to move towards an effective KM practice in the future, TRIGO will also need to take another 3 components include the organizational culture, the KM metrics, and the KM team into account in terms of how to build these components up in order to enhance the true success of the KM implementation in the long run. However, the proposed CKM system in this paper can be referred as a guideline in an initial phase initiated for the KM strategy that will be implemented in the future with an approval of the top management.

Based on the several interviews that the researcher conducted, there are several issues to address regarding how knowledge management is handled within TRIGO. The researcher can safely express several weaknesses that prevent improvement. Insufficient coordination to standardize knowledge management practices, a lack of centralization that led to segregation of data on several tools and missing support systems around the tools in the form of training, internal IT helpdesk. This complex scenario coupled with divergent expectations regarding the ideal KM tool has pushed several independent initiatives from quality manager to develop tools by their own means to perfectly fit their requirements. To avoid these “unofficial” tools and to compromise

data transparency, a formal platform where each user's goals, responsibilities and needs should be sought. The challenge is to find the right balance between the shared vision and the individual needs allowing for both flexibility and personalization. User profiles should include quality consultants, business managers, quality manager and quality inspectors respectively. Hereby, a common established tool should be implemented in parallel with the well planned change management for TRIGO in order to deal with change, not only for the knowledge sharing platform itself, but also for the human resource aspect that would be another key of success for TRIGO in the long run.



CHAPTER V

DATA ANALYSIS PHASE 2 (BENCHMARKING OF THE TOOLS)

5.1 KM tools presentation

After the current TRIGO's process and internal needs regarding the KM tool for TRIGO were analyzed from the previous chapter, the notions about ideal KM tool have been given. By deliberating 4 pillars, i.e. simplicity, efficiency, flexibility and interactivity, the search for the information regarding existing KM tools in the market has been narrowed down. As a result, there were 7 notable knowledge sharing platforms selected and analyzed by the researcher, and then presented to the company. All of the proposed tools have been used by many companies and have highly been recommended from many websites by considering their prominent knowledge management capabilities. The researcher will illustrate their qualifications as follows:

5.1.1 SharePoint

1. Description: a portal-based platform for creating, managing, and sharing documents and customized web services
2. Clients: Atfran, Safran, SII, Nestle', Kraft food, Monsanto, Segula Eurogiel, SODETI

User Experience	10 permission groups, highly developed mobile application, high level of interactivity
Tool Management	10 GB max per file, 2 types of license, limited after sales service
Content	Online editing, versioning, great variety of applications, search inside MS office and PDF files
Categorization	Highly customizable interface
Additional Features	Big variety of video and picture formats, automatic report generation

Price (SharePoint Farm+CAL)*N of users + Server license*N of servers

(Source: <https://www.youtube.com/watch?v=Pvjg4rX8uq0>, <https://www.youtube.com/watch?v=6ADQpn3xl2U>)

5.1.2 Scoope.it!

1. Description: a publishing and *content curation* platform/ “Online Magazine” looking web pages/ internal and external sharing

2. Clients: AKKA technologies, Altran Capgemini, Consulting SAP, Renault, Nissan, Docker

User Experience	Content curation and contribution rights, applications for iOS and Android, very limited communication tools
Tool Management	30 MG per document, no licenses required
Content	No online editing and versioning
Categorization	Personalized content feed, no search inside documents
Additional Features	Only picture format
Price	3 prices packages, customization

(Source: <https://www.youtube.com/watch?v=p3wMwNxgcTU>)

5.1.3 Xwiki

1. Description: an open source platform/ multi-level collaboration/ structured or unstructured data/ end user oriented

2. Clients: Amazon, EMC2, Chronoposte, Edf

User Experience	End user oriented, setup required, languages limits
Tool Management	Open source, highly rated after sale, Paris based
Content	No online editing of attachment, free 63,000 add ons
Categorization	Live tables, topic tags, intra document links
Additional Features	Limited supported formats, development potential
Price	User basis Premises/Cloud (per year 500€to 10,000€/per month 10€to 200€)

(Source: <https://www.youtube.com/watch?v=Pv4jPCaU99g>)

5.1.4 Confluence

1. Description: Wiki collaboration platform/ intranet social media appeal/ document workflow, organize processes, customer support/ team level

2. Clients: Safran, Altran, Societe pour l'informatique industrielle (SII)

User Experience Interactive, unintuitive, weak smartphone experience

Tool Management 25GB cloud limit

Content Limited online editing, paying add-on dependence

Categorization Effective search, global/personal space

Additional Features Format compatibility

Price 50 users basis Premises/Cloud (\$2,500 one-time payment/
\$200 per month)

(Source: <https://www.youtube.com/watch?v=qgl264XgLis>)

5.1.5 Alfresco

1. Description: Open source enterprise content management/ web publishing platform and digital image management tool/ integration capabilities and wide range of supported formats

2. Clients: Lafarge, Nasa, Cisco

User Experience Highly customized access, some uploading issues

Tool Management Hybrid synchronization, up to 1GB of cloud storage,
no FAQ

Content Up to 160 formats supported, integrations (SAP, Google,
Microsoft, etc.)

Categorization Smart folders/ myspace list/ dashboard

Additional Features No skill/ competence matrix

Price Quotation based (Business & Enterprise 300 users &
1,000 users)

(Source: <https://www.youtube.com/watch?v=dRMffceHv1w>)

5.1.6 eXo Platform

1. Description: Open source digital collaboration platform/ knowledge, document and content management/ social engagement and project collaboration tools

2. Clients: Alten, UCLA, Elysee, HSBC, Orange TM, NATO OTAN, Johns Hopkins University

User Experience	User friendly, highly customized access
Tool Management	Full range of services offered, open source
Content	Add-ons and integration with various systems, online editable
Categorization	User oriented, searchable
Additional Features	Report generation, photos
Price	Cloud plan: \$30/user (annually) or \$72/user (3 years) Enterprise plan: Up to 25 users cost \$2,400, Up to 50 users cost \$4,200, Up to 75 users cost \$5,400, Up to 100 users cost \$6,000, More than 100 users cost available by quote

(Source: <https://www.youtube.com/watch?v=QKFLin7CPyk>, <https://www.youtube.com/watch?v=fmH0j2KVsRY>)

5.1.7 TallyFox Talliam

1. Description: Business ecosystem platform/ cloud-based professional services automation (PSA)/ software solution for knowledge management/ modules for project, knowledge, document and resource management

2. Clients: N/A

User Experience	Highly customized access
Tool Management	Various support options customized to different needs
Content	Custom content categories
Categorization	Standardized & customized
Additional Features	Image, video, link
Price	Different plans Basic: start from \$50/month/user Plus: \$50/month/user Plus: \$500/year/user

(Source: <https://www.youtube.com/watch?v=If0R5zwGlpk>)

5.2 Comparison table

After the qualifications of the tools were categorized along the same measuring criteria, a comparison table was established by the researcher to provide ratings to compare those tools. However, Alfresco is not excluded in this table because the information regarding its price is not available.

Table 5.1 A comparison table of KM tools

Features/Tools	(Weight)	SharePoint	eXo Platform	Xwiki	Confluence	TallyFox Talliam	Scoope.it!
User Experience	2	★ ★ ★	★ ★ ★	★ ★	★	★ ★	★
Tool Management	2	★ ★	★ ★	★ ★ ★	★ ★	★ ★	★ ★
Content	3	★ ★ ★	★ ★ ★	★ ★	★	★ ★	★
Categorization	3	★ ★ ★	★ ★	★ ★ ★	★ ★ ★	★ ★	★ ★
Additional Features	2	★ ★ ★	★ ★ ★	★	★ ★	★	★
Price	1	★	★ ★	★ ★ ★	★ ★	★ ★	★
Total Value		35	33	30	24	24	18

Since the principal purpose of the tool selection process is to find out the best possible solution that fits as much as possible with the 4 main pillars of the ideal KM tool as already illustrated in the previous chapter, the scoring model was applied to evaluate these softwares. First of all, the criteria were determined and the weights were assigned accordingly to each of them. After that, the scores for each tool were given in the table based on the gathered information. Referring to the table, the highest score for each criterion was given by using 3 stars and the lowest score was given by using 1 star serially. Then, the sum of each score times the weight finally generates the total value of each KM tool. After gathering the scores, SharePoint has the highest total value according to the comparison table.

5.3 Tool management strategies

There were 3 strategies regarding the tool management analyzed and proposed by the researcher. However, each of them has the different pros and cons and will be described in details as following:

5.3.1 Develop existing tools

In regard to the pros of this method, there are some reasons that make this strategy interesting. Firstly, the company would be able to gain benefit from the development license if they decide to use the existing tool that has already been established. In addition, the company would be able to preserve the initial sunk cost of the new software venture. Concerning the workforce issue, the company would benefit from not only the staff who are already familiar with the existing tool, but also from the available IT workforce. Furthermore, there is no need for the company to import the data from the old tool to the new one which can be risky to lose some important information.

However, there are still some cons that the company has to incur. One of them is about the short term cost that the company needs to invest for development because there is no ready-made solution provided to suit all requirements of TRIGO. Another disadvantage is that the company has to face the risk of inertia while developing the tool to be more complete, that may lead to the technical limitations in the services offered to the clients.

5.3.2 Adopt new tool

This is another notion that can also be beneficial for the company, but the company has to reset the whole practices in KM in order to get along with the new KM tool that the company decides to adopt. Nonetheless, this strategy would presumably be able to pay off for the company in some possible ways. Namely, the company would be able to maintain its consistency of policy since all stakeholders start their paces again at the same point with the new tool. Moreover, the company will have more chance to search for the tool that can offer better functionalities than the old one and fit best with the company. This will flourish an efficiency of the overall operations within the company, but maybe in the long run.

Regarding the cons of the new tool adoption, it is undeniable that TRIGO has to invest a lot of money to have the newly common-established tool which can be expensive. In addition, the company would probably incur a problem regarding the staff's resistance to change which can be one challenge for the company in terms of how to create motivation for them to adopt and adapt themselves to the newly selected tool.

5.3.3 Combine new tool with existing tools

Another strategy that can be plausible is to combine the new tool with the existing ones. There are some reasons why this approach may be appropriate. First of all, there have been obviously different user needs inside TRIGO as we can see from the interview results in the previous chapter that some quality managers have tried to develop their own tools to serve their own interests and needs. Secondly, the company would invest less than by adopting the new tool by applying this method. Moreover, this option can be selected just in case there is no any other suitable alternative provided on the market.

In regard to the cons of this approach, some concerns needed to be taken into account. Firstly, the company would unavoidably incur higher costs in the long run to keep both the existing tools and the new tool updated in parallel. Secondly, this approach would foster the decentralization of the KM tools to be even more than in the past unnecessarily. In addition, the company may incur some possible problems regarding the compatibilities between the new tool and the existing tools which may affect its business unintentionally.

5.4 Conclusion

After discussing 7 alternatives for KM tools that had been proposed by the researcher, it was agreed that the tool SharePoint would be chosen as the best solution for TRIGO today. This decision came from the fact that tool has already well-established inside the company and it can answer the majority of the needs identified during the diagnosis phase.

However, the first two stages of the project, i.e. the diagnosis phase and the benchmarking phase revealed that most of SharePoint potential is not used today. The proper methodology and standardized processes for gathering and sharing data as well as providing support for the operational tasks still need to be developed.

CHAPTER VI

DATA ANALYSIS PHASE 3 (DEFINITION OF THE SPECIFICATIONS TO DEVELOP/IMPLEMENT THE SERVICE)

After the current TRIGO's process and internal needs have already been diagnosed as well as the tools benchmarking and selection process has also been done, this chapter will emphasize on how to provide the definition of the specifications to develop or implement the service. On the other hand, the researcher will illustrate the definition of service standard offer that the company would propose to the clients in the future. By the way, this service standard offer definition has been synthesized and distilled from 2 previous phases which include the diagnosis phase and the benchmarking phase respectively. The definition in this chapter will be described along the following captions: First of all, it will state about the customer challenge in terms of why TRIGO is the right answer for them to help them maintain competitive positions.

Secondly, it will give an overview in terms of how TRIGO provides the solutions to the clients by referring to the CKM methodology that has been invented by the researcher and it will be elaborated in details in the next chapter. In addition, it also gives the information about the different categories of data that would be listed in the data content in the selected knowledge sharing platform. Also, the figure presenting about the components that would enhance the success for the CKM solution will also be presented to give a general idea to the clients.

After all, the researcher will describe about the benefits that the clients will get providing that they choose TRIGO to offer the quality solutions for them. Thus, by referring to the valuable resources that TRIGO has, in order to support the idea. The complete service standard offer definition will be illustrated as follows:

6.1 Customer Knowledge Management

6.1.1 Customer challenge

Nowadays, many incumbent companies struggle to maintain their competitive positions by looking for the best quality service provider who could respond effectively to quality issues and leverage continuous improvement. TRIGO's integrated knowledge management solution ensures that its clients benefit from the best practices coming from previous experiences and lessons learnt generated after each mission.

6.1.2 The TRIGO solution

According to EN 9100 TRIGO's quality management system (QMS) for knowledge management in aerospace industry, Customer Knowledge Management (CKM) solution is a process powered by a collaboration platform, which enables to collect and spread lessons learnt inside TRIGO's network to capitalize on the best practices and innovations in terms of processes, procedures and services.

1. Two main targets of CKM solution:

- Accumulate added-value knowledge after each mission and generate lessons learnt

- Spread the “know-how” inside TRIGO's network

2. Methodology:

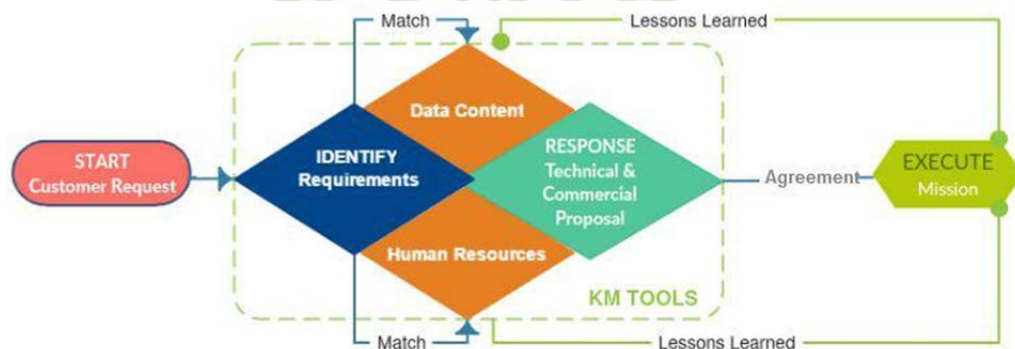


Figure 6.1 CKM methodology

3. Main categories of data:

- Case Studies (more than 100 in 20 countries)
- Training Modules (more than 300 field of expertise)
- Footprints (for more than 8'000 customers)
- Team members profiles (referencing more that 200 competences & skills)
- Reports (tracking 80 KPI's after each mission)
- Auditing (more than 300 inspections)
- Defect library (more than 500 defect types listed)

*(Figures given are not accurate, but used as an example for the brochure)

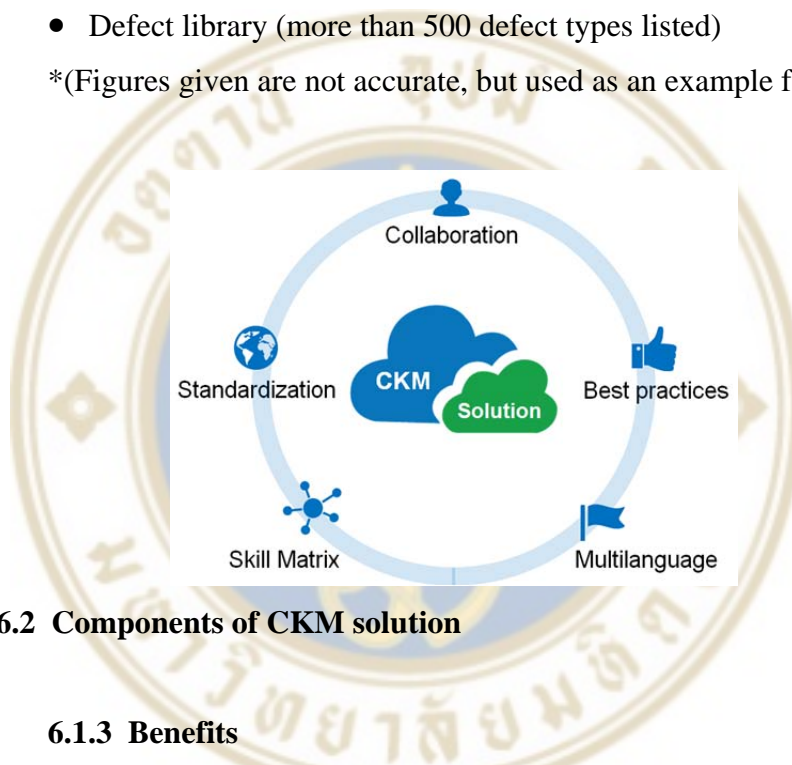


Figure 6.2 Components of CKM solution

6.1.3 Benefits

Choosing TRIGO means getting access to state of the art knowledge management system: 15 years' worth of data gathered from 24 countries, collected during more than 50,000 missions. TRIGO selects the brightest talents among 8,000 quality experts to provide ready-made, proven and immediate solutions. CKM system is synced to TRIGO's client operations, ready to fulfill any sophisticated requirement in a short time period ensuring that the client gets the best solutions possible at the end of the day. Footprints from past experiences become practical know-how in TRIGO's present and future projects.

CHAPTER VII

RECOMMENDATIONS AND CONCLUSION

7.1 CKM process

For the final stage of the project, the main focus was to describe an “ideal” process of the customer knowledge management and to show how SharePoint, the tool chosen as the best solution for TRIGO during the benchmarking phase, would be integrated inside TRIGO’s network as well as how it would contribute to the process of capitalization on the return on experience and the lessons learnt.

7.1.1 Overview of CKM process

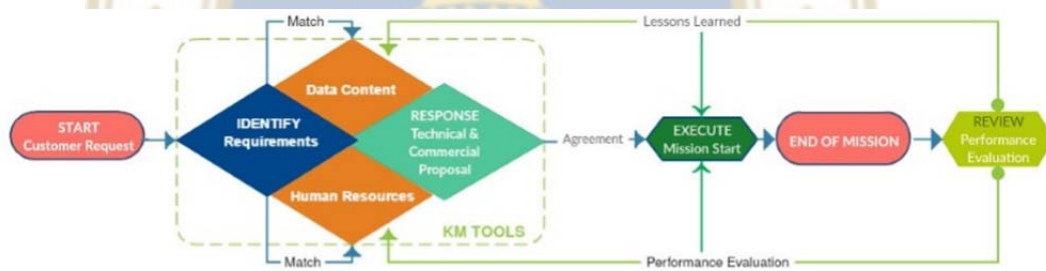


Figure 7.1 Overview of CKM process

Regarding an overview of the CKM process as illustrated in the figure 7.1, there are different symbols and colours used to identify different steps and imply different meanings in the proposed CKM flowchart. Those symbols and their meanings are illustrated in the figure 7.2. By the way, to explain the overview of the CKM process briefly to give the big picture first before showing the detailed steps in the flowchart, the overall process would basically start with the customer request for TRIGO. After all, within the KM tool boundary expressed with the dash line, TRIGO needs to identify the requirements that can be matched with 2 components, i.e. the data content within the database and the human resource aspect in terms of who is going to match with different tasks. Therefore, the response in terms of technical and commercial proposal

will be provided after TRIGO has the right data as well as the right people on hand, an agreement would be established before an execution of mission in the next step until the end of the mission. Subsequently, TRIGO will receive feedbacks from the customers that will foster the review phase for the performance evaluation. In this phase, TRIGO will be able to create 2 kinds of progress as the inputs for SharePoint, i.e. the lessons learned in order to update in the data content, and the performance evaluation to update the profile of each individual inside the tool that will link to the skill matrix available for the next missions. Nonetheless, the lessons learned and the performance evaluation that have been created, would not be beneficial only to support the update inside SharePoint, but also enhance the execution of the next missions since the data would be easily retrieved from the systems to support TRIGO's subsidiaries across the globe.

Referring to the Integrated KM Cycle by Dalkir, this proposed CKM process would be a part to solve the problems regarding 3 major stages, i.e. Knowledge capture and/or creation, Knowledge sharing and dissemination, Knowledge acquisition and application serially. In regard to the first stage, the proposed process would guide more systematic way to create the knowledge that has been captured regarding the lessons learned and performance evaluation as inputs into the system, and these inputs would be beneficial for the next missions in the future. For the second stage about knowledge sharing and dissemination, as SharePoint has been agreed to be used as a common knowledge sharing platform in the future, and the systematic process has already been set up as a guidance for the company. Hence, the knowledge sharing and dissemination problems would be diminished. However, this cannot happen effectively without a lot of supports for CKM implementation that will be described in details in the last part of this chapter. Regarding the third stage about knowledge acquisition and application, the knowledge would be contextualized in 2 main aspects, i.e. data content and human resource, in order to be easily understood ("acquisition") and used ("application") by the subsidiaries in the different regions since the knowledge would be easily retrieved from the system. By applying the proposed CKM process in the real operations, the researcher believes that TRIGO would be able to gain the return on experiences as previously anticipated.

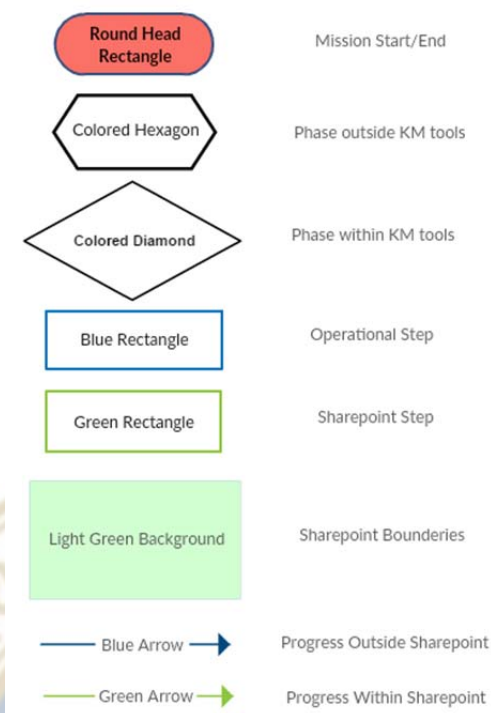


Figure 7.2 Determined symbols

7.1.2 Flowchart

After the overview of the process has already been put forward, the researcher will illustrate the CKM process in details by proposing the following flowchart.

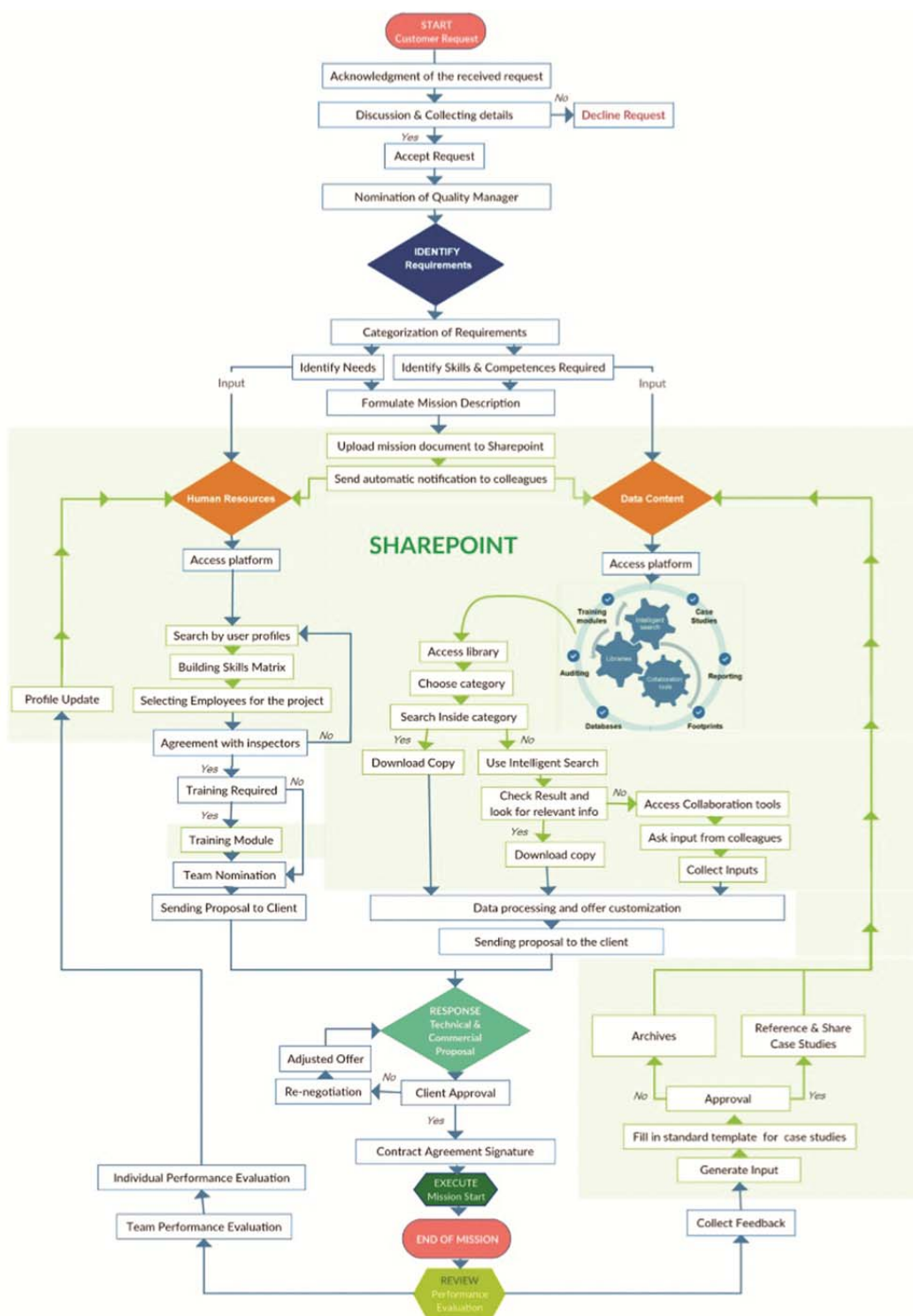


Figure 7.3 CKM flowchart

As presented in the flowchart, the proposed CKM flowchart comprises several steps needed to be clarified. Nevertheless, this invented flowchart stemmed from the researcher’s creativity as well as the possibility. The researcher will illustrate the details

of each step in the table in terms of the inputs, the activities, the outputs, and the people who take charge of each step respectively. Subsequently, the explanation for each table will be provided to make it easier to be understood as follows:

7.1.3 Customer request

Table 7.1 Customer request

Input	Activity	Output	Responsible	
Needs and requirements	<pre> graph TD Start([START Customer Request]) --> Ack[Acknowledgment of the received request] Ack --> Disc[Discussion & Collecting details] Disc -- No --> Decline[Decline Request] Disc -- Yes --> Accept[Accept request] Accept --> Nom[Nomination of Quality manager] Nom --> Identify{IDENTIFY Requirements} </pre>	Customer request	Sales/ Customer service	
Customer request		Confirmation email		
Confirmation email		Confirmation email		
Confirmation email				
Nomination letter, Customer request			Nomination letter	Business development department Quality manager

The whole CKM processes will start with the customer request when they have some needs and requirements. The people who take charge in this step should be sales people or the people in the customer service department because they directly contact with the customers. When TRIGO has acknowledged the request, the company will send the confirmation email to the customer. However, those requests needed to be discussed and collected the details before deciding whether to accept or decline the request, provided that they are out of scope of services the company can provide. Either of them would be affirmed by the confirmation email sent to the customer. Providing that TRIGO accepts the requests, the suitable quality manager for particular task will be nominated by the business manager from the business development department.

Subsequently, the nominated quality manager will identify the requirements in details according to the received requests in the next phase.

7.1.4 Identify requirements

Table 7.2 Identify requirements

Input	Activity	Output	Responsible
Nomination letter, Customer request List of identified needs, List of identified skills & competencies Mission document	<pre> graph TD A{IDENTIFY Requirements} --> B[Categorization of requirements] B --> C[Identify needs] B --> D[Identify skills & Competencies required] C -- Input --> E[Formulate mission description] D -- Input --> E E --> F[Upload mission document to Sharepoint] F --> G[Send automatic notifications to colleagues] F --- G G --> H{Data Content} G --> I{HR} H -- Input --> C I -- Input --> D </pre>	List of identified needs, List of identified skills & Competencies Mission document	Quality manager

After the quality manager has been assigned for the task, he/she needs to categorize those requirements to identify needs as well as skills and competencies required for the task to be the inputs for 2 main phases, i.e. data content and human resource aspect. Then, the list of identified needs as well as the list of identified skills and competencies will be the inputs to generate the mission document before being uploaded to SharePoint and the automatic notifications will be sent to colleagues or the related parties for the task.

7.1.5 Data content

Table 7.3 Data content

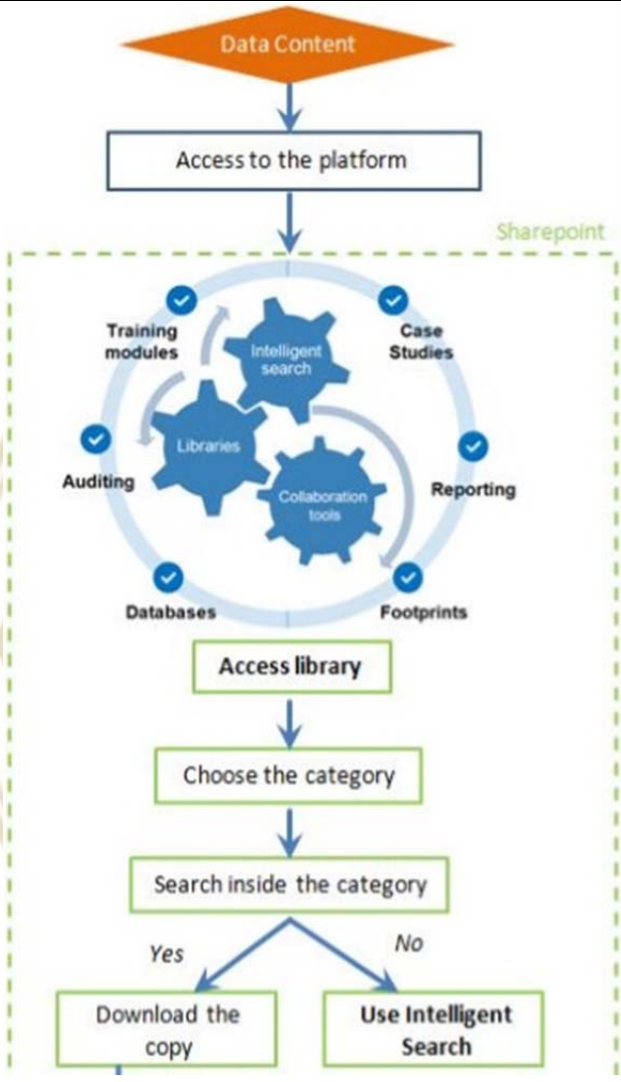
Input	Activity	Output	Responsible
List of identified needs,	 <p>The flowchart illustrates the process of accessing and searching for data content. It begins with a diamond-shaped box labeled 'Data Content'. An arrow points down to a rectangular box 'Access to the platform'. Below this, a dashed green box labeled 'Sharepoint' contains a circular diagram with four gears: 'Intelligent search', 'Libraries', 'Collaboration tools', and 'Auditing'. Surrounding these gears are six categories: 'Training modules', 'Case Studies', 'Reporting', 'Footprints', 'Databases', and 'Auditing', each with a checkmark. Below the 'Sharepoint' box is a rectangular box 'Access library'. An arrow points down to 'Choose the category', followed by 'Search inside the category'. From 'Search inside the category', two arrows branch out: 'Yes' leads to 'Download the copy', and 'No' leads to 'Use Intelligent Search'.</p>	<p>Historical data</p> <p>From:</p> <ul style="list-style-type: none"> -Case Studies -Reports -Footprints -Databases -Auditing -Training modules 	<p>Quality manager</p> <p>IT department</p> <p>Quality manager</p>

Table 7.3 Data content (cont.)

Input	Activity	Output	Responsible
<p>Historical data From: -Case Studies -Reports -Footprints -Databases -Auditing -Training modules Offer description</p>	<pre> graph TD A[Download the copy] --> D[Data processing and offer customization] B[Use Intelligent Search] --> C[Check the result and look for the relevant info] C -- Yes --> D1[Download the copy] C -- No --> E[Access Collaboration tools] E --> F[Ask for the input from colleagues] F --> G[Collect inputs] D1 --> D G --> D D --> H[Sending proposal to the client] H --> I{RESPONSE Technical & Commercial Offer} </pre>	<p>Offer description Customer offer</p>	<p>TREQ/ Other quality managers Sales/ Customer service</p>

Considering the first phase which is the data content, the quality manager can access to the platform managed by the IT department after he/she has the list of identified needs on hand already. Inside SharePoint, the quality manager will be able to choose the suitable category and download the provided documents related to historical data or even use the intelligent search before downloading the copy on demand. If the required data is related to high customization, the quality manager can ask for the input from the colleagues within the platform, both from TREQ department, or even from other quality managers before collecting the inputs in terms of the historical data, e.g. case studies, reports, footprints, databases, auditing, training modules. The collected inputs will be used to process data and offer customization before sending proposal to the client which is the response in terms of the technical and commercial offer. This step will be done by the sales people or the customer service department.

7.1.6 Human resource

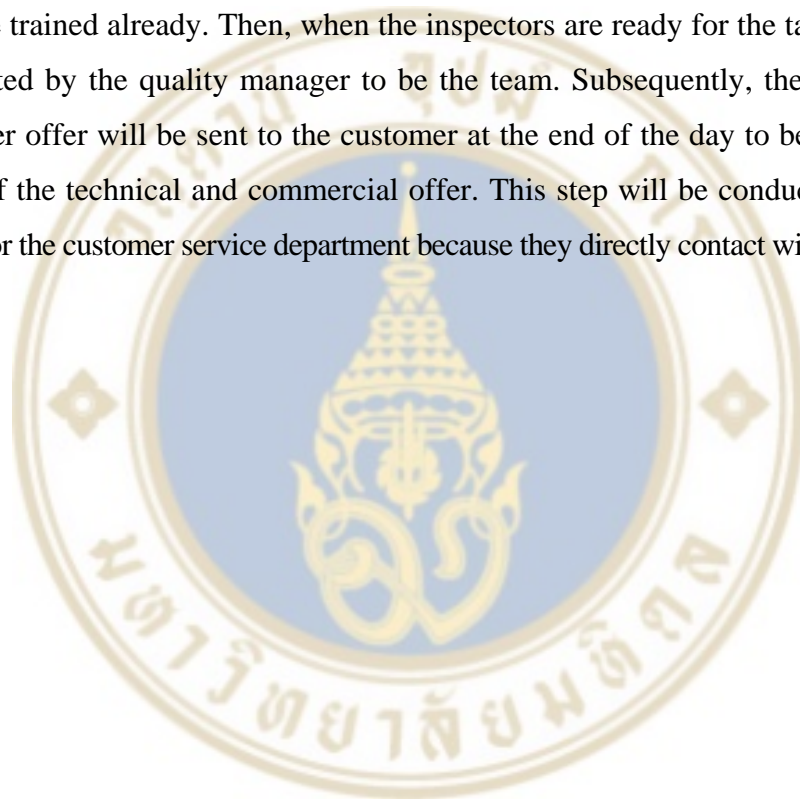
Table 7.4 Human resource

Input	Activity	Output	Responsible	
List of identified skills & Competencies	<pre> graph TD HR{HR} --> Access[Access to the platform] subgraph SearchBox [] Search[Search by profile users] Matrix[Building skills matrix] Select[Selecting employees for the project] end Access --> Search Search --> Matrix Matrix --> Select Select --> Agree[Agreement with inspectors] Agree -- No --> Search Agree -- Yes --> TrainReq[Training required] TrainReq -- No --> Nominate[Nominating the team] TrainReq -- Yes --> TrainMod[Training module] subgraph TrainBox [] TrainMod end TrainMod --> Nominate Nominate --> Send[Sending the proposal to the client] Send --> Response{RESPONSE Technical & Commercial Offer} </pre>	List of selected Candidates	Quality manager IT department	
List of selected Candidates		Request for training	Request for training	
Request for training		Training certificate	Training certificate	TREQ
Training certificate		Nomination letter	Nomination letter	Quality manager
Nomination letter		Customer offer	Customer offer	Sales/ Customer service

Another phase is about human resource. The quality manager will access to the platform managed by the IT department after he/she has the list of identified skills and competencies on hand already. The purpose is to find the right people for the right job. Inside SharePoint platform, the quality manager will be able to search users from various profiles, build the skills matrix as well as select employees for the project. Finally,

the quality manager will have the list of selected candidates in order to make an agreement with the inspectors. Providing that any of them do not agree to do the task, the quality manager will search for other users and build the skills matrix again in order to have enough inspectors to be a part of the team.

If they agree to do the job, the quality manager will see and decide whether they need any training or not. Provided that they need training, especially for the task that is highly customized, the request for training will be sent to TREQ which manage about training module. After that, the inspectors will receive the training certificate after they are trained already. Then, when the inspectors are ready for the task, they will get nominated by the quality manager to be the team. Subsequently, the proposal or the customer offer will be sent to the customer at the end of the day to be the response in terms of the technical and commercial offer. This step will be conducted by the sales people or the customer service department because they directly contact with the customer.



7.1.7 Response & execution

Table 7.5 Response & execution

Input	Activity	Output	Responsible
Mission document	<pre> graph TD Start{RESPONSE Technical & Commercial Offer} --> Approval[Client Approval] Approval -- No --> Reneg[Re-negotiation] Reneg --> Adjusted[Adjusted Offer] Adjusted --> Start Approval -- Yes --> Signature[Contract Agreement Signature] Signature --> Execute{{EXECUTE Mission Start}} Execute --> End([END OF MISSION]) End --> Reviews{{REVIEWS Performance Evaluation}} </pre>	Customer offer	Sales/ Customer service
Confirmation email		Signed contract	Confirmation email Signed contract
Signed contract		Progress report	Quality manager
Progress report		Final report	

After the historical data useful for the project as well as the appropriate manpower have already been deployed, the customer offer still can be adjusted based on the approval of the client. If the client approves, the contract will be signed. This phase will be done by the sales people or the customer service department. Subsequently, the signed contract will eventually lead to the execution of the mission responsible by the quality manager who will supervise the quality inspectors to complete the task. The progress report will be an output from this phase. However, the final report will be generated by the end of the mission before moving on to the review phase onwards.

7.1.8 Data content reviews

Table 7.6 Data content reviews

Input	Activity	Output	Responsible
Appraisal by client Client satisfaction result Mission data	<pre> graph TD A[REVIEWS Performance Evaluation] --> B[Collect Feedback] B --> C[Generate Input] C --> D[Fill in standard template for case studies] D --> E[Approval] E -- Yes --> F[Reference & Share Case Studies] E -- No --> G[Archives] F --> H{Data Content} G --> H H --> I((Sharepoint)) subgraph I direction TB I1[Training modules] I2[Case Studies] I3[Reporting] I4[Footprints] I5[Databases] I6[Auditing] I7[Librarians] I8[Intelligent search] end </pre>	Appraisal by client Client satisfaction results Historical data for lessons learned: -Case Studies -Reports -Footprints -Databases -Auditing -Training modules	Sales/ Customer service Quality manager Marketing Department Quality manager

After each mission has already been conducted, the reviews phase for the performance evaluation is another significant phase that will generate the inputs for the main 2 phases within the KM tool, i.e. data content and HR. Regarding the data content, after the client satisfaction results have been collected by the sales people or

Regarding another phase within KM tool which is HR, the review phase will also generate inputs for HR. The client appraisal will be taken into account to conduct the team performance evaluation as well as the individual performance evaluation which will generate the output in terms of the performance report and the employee profile. After all, the performance report and the employee profile will be deliberated to conduct the profile update within the KM tool which is SharePoint. The employee profiles that have already been updated will be useful and referred as the workforces that will be ready to be deployed for the next missions in the future.

By considering the whole model of the proposed CKM process, the researcher believes that it will be the starting point that guides TRIGO to be more effective in terms of the customer knowledge management since the model has been invented to solve the problems regarding each stage of the integrated KM cycle. Nonetheless, there are some components described earlier which are out of scope of the project that still needed to be taken into consideration for the strategic level in order to enhance the further development of the company in the future.

Regarding the integration between the theory and the CKM model proposed, it can be described as follows. Referring to the Integrated KM Cycle by Dalkir, the complete knowledge management process comprises of 3 main stages including 1. Knowledge capture and/or creation, 2. Knowledge sharing and dissemination, 3. Knowledge acquisition and application. By considering the CKM model, it has been invented to enhance the completeness of the knowledge management process within TRIGO. Firstly, the lessons learned and the performance evaluations which are generated from the review phase of every mission will be the inputs that are put back to the knowledge sharing platform to enhance the first stage of knowledge capture and/or creation. Secondly, the knowledge content will be assessed by the quality managers before sharing and disseminating the appropriate knowledge to the quality inspectors in the second stage of knowledge sharing and dissemination. Furthermore, the knowledge that have regularly been updated and contextualized in proper categorizations within the knowledge sharing platform will be ready to be understood and used to foster next missions in the future of TRIGO onwards. It means that the third stage of knowledge acquisition and application will also be flourished because the contextualized knowledge will be ready to be retrieved in order to fulfill various requirements. On the other hand, TRIGO would have the completed processes

of the customer knowledge management by following this proposed CKM model at the end of the day.

7.2 Limitations of the model

Although the model has been well deliberated, some limitations still exist. The researcher will describe those limitations as following. Firstly, it is undeniable that the proposed model has the main focus on KM aspect. However, there are other aspects apart from KM needed to be taken into account. Furthermore, the limitations of the model included no focus on negotiation of price as well as the executions phase, which were identified to be out of the scope for the project. After all, the further development of the view on the support of the proposed CKM system is essential including such aspects as maintenance and governance of the CKM solution.

7.3 Recommendations for CKM implementation

The lack of consistency in terms of CKM procedures inside TRIGO was revealed during the previous stages of the project, which shows the importance of introduction of centralized governance for the CKM processes as well as guidelines supporting teams in their day-to-day activities. The role of IT department as CKM solution support should not be underestimated. Strong communication activities and training are necessary for CKM implementation. Regarding the feedback, the results of the project were highly appreciated by the company. The outcomes revealed will be presented to the management and will become the starting point for CKM system development inside TRIGO.

REFERENCES

- Barclay, R., and Murray, P. (1997). What is knowledge management? *Knowledge Praxis*. Retrieved from <http://www.media-access.com/whatis.html>.
- Dalkir, Kimiz. (2005). *Knowledge Management in Theory and Practice*. Burlington, MA: Elsevier Butterworth-Heinemann.
- Information Week (Sept.1, 2003). *Ten Principles for Knowledge Management Success*. Available at <http://whitepapers.informationweek.com>.
- Kaufman, F. (1966). Data systems that cross corporate boundaries. *Harvard Business Review*, (January-February), 141-155
- Knowledge Management Cycle. (n.d.). *General information*. Retrieved from <https://km-cycle.weebly.com>
- Pritam. (2015). *9 Tips to Grow Corporate Memory*. Retrieved from <https://www.proprofs.com>.
- TRIGO. (n.d.). *General information*. Retrieved from <https://www.trigo-group.com/en>.



Appendix A: Interviewee List

Interviewee 1

Role: Global Resident Engineering Service Manager (TREQ)

Industry: Aerospace, Automotive and Heavy Transportation Business lines

Interviewee 2

Role: International Sales and Key Account Manager

Industry: Aerospace and Heavy Transportation Business lines

Interviewee 3

Role: Change Management Project Manager

Industry: Automotive Business line

Interviewee 4

Role: Quality Manager

Industry: Automotive Business line

Interviewee 5

Role: Director of Aerospace and Business Development in North America

Industry: Aerospace Business line

Interviewee 6

Role: Contract Manager for U-Shin project

Industry: Automotive Business line

Interviewee 7

Role: Project Manager for Stream5 project

Industry: Aerospace Business line

Interviewee 8

Role: Contract Manager for Stream5 project

Industry: Aerospace Business line

Appendix B: Interview Questions and Answers

Interviewee 1

Role: Global Resident Engineering Service Manager (TREQ)

Industry: Aerospace, Automotive and Heavy Transportation Business lines

Scope of activities:

1. Can you tell us about Global Resident Service network?

Answer: Global resident service network include two levels. First level - focal points for different areas of business and countries responsible for resource management, sales leads, business proposals and escalation of information. Second level - resident engineers and associates who execute the projects.

2. What is the role of TREQ? What are the main goals and tasks fulfilled by the department?

Answer: TREQ department is new and has 3 main fields currently: 1) resident engineering, 2) quality expert consulting (QEC) - auditing, supplier development and training, 3) methodology and measurement of services- analysis of divisions and calibration of services. Today in every country there is a TREQ focal point. For most of global project there is a dedicated contract manager. For countries where there is no TREQ coordinator or manager, the focal point would be a country manager. In the future, the two main targets include identifying countries with high business potential and ensuring the TREQ focal point network as well as taking decision on resource management.

3. How do you share information inside TREQ?

Answer: Communication is an important subject as the company is growing quickly and every year there are many M&A that take place. There are three main ways of communication in TREQ. One of the most powerful communication methods is communication from country manager to country manager. Second communication surface – direct communication. It can be on the topic of tracing, customer information, cross country challenges, etc. For example, if it is a pure sales issue, there would be direct communication between sales managers. The third one – internal communication inside TREQ with strong community and commodity discussions.

Current KM tools:

4. Which Knowledge Management (KM) tools do you use?

Answer: Case Studies is an important KM tool in the company. The information about different business cases is sent by managers to Marketing department, which in turn put data in standardized Case Studies templates and share them with TRIGO managers around the world through a wiki interactive platform Confluence. Cases studies are shared internally, and the manager decides what to share or not with the client. Sharepoint is another KM tool acting as an intranet and used for sharing information about ongoing projects such as price list, contact list, etc. Today there is also a project on Skill Matrix that will be introduced in Sharepoint in the future. The idea of the project is to create personal profiles for TRIGO employees and facilitate the search for skills or knowledge for a specific project internally. Finally, Antifog is a database where all the data about different missions is stored.

5. What are positive and negative aspects of existing KM tools?

Answer: Case Studies is a well-structured and well-formulated content where it is possible to find information about which methodology was used for the project, country, project key figures and achievements, points of contact, etc. Marketing department ensure that templates are following the standard structure and are written in English. It is easy to search for the templates and navigate on Confluence platform. However, a more dynamic platform that requires less manual work would be highly beneficial.

6. Based on your own experience, would you recommend some other KM tool applicable for TRIGO global quality residence network?

Answer: In Bosch BGN intranet was used as platform for all data storage and sharing. Employees could find any data such as news of the company, structure of the organization, focal points, etc.

Ideal KM tool:

7. Can you describe an ideal tool for Internal Customer KM for your network?

Answer: All KM tools should act as a dynamic database as the data is changing all the time. A good example can be footprints of TRIGO businesses for different countries. There are several KM tools in the company, so somehow these systems should communicate to be dynamic. Skill matrix is also very important as it

would help to see which employees can contribute which projects and make the search for skills and talents easier.

8. What functionalities would you highlight as the most important?

Answer: An idea KM tool would be work as “personal assistant” for daily work that can give you answers to all kind of questions you need to do your job. For this a tool with intelligent search functionalities is required. Moreover, high speed is important to ensure the reactivity of work. As for interactivity and communication, chat tools are not always a good solution because there is no data safety and is very difficult to control of the content shared. Encrypted emails are also important. Sharing sensitive data such as sales and price information, budget require confidentiality and high level of data safety.

Interviewee 2

Role: International Sales and Key Account Manager

Industry: Aerospace and Heavy Transportation Business lines

I. Questions about shared documents

Presentation Thèse KM 2015 TRIGO

1. What were the aims of this research? Any KM solutions proposed?

Answer: A study made in TRIGO Nantes back in 2015, focused on the internal systems, its inventory and diagnosis, providing a detailed description, an evaluation of the KM maturity and potential improvements to capitalize on experience. A final solution in the form of a system diagram (logigram), findings were never implemented.

2. Slide 3: What is “GRAMMS”?

Answer: GRAMMS is a set of requirements imposed by Airbus to its suppliers. It incorporates an explicit section with expectations regarding KM.

3. Slide 9: Which of the tools are still relevant? Which one are not mentioned?

Answer: Most of the tools are still relevant, some however are not known or may be underused/forgotten as well as some may not be applicable within TREQ need. This will be confirmed with the requirements expressed during the interviews.

4. Slide 10: Are the analysis of the processes and parties involved still relevant for TRIGO today?

Answer: Since we are focusing on TREQ their relevance have to be confirmed. 4 distinct parties involved: Quality Consultants, Business Managers, Quality Managers and Inspectors.

Example of KM in quality assurance plan for Airbus

5. Could you explain the purpose of this document? Is it an example of the template to be shared within the network of inspectors?

Answer: It illustrate the kind of document that could be stored on the platform to be available for incoming similar projects. It assures the continuity, consistency and capitalization on previous experiences.

II. Definition of the project: Customer Knowledge Management

Customer KM- the return on experience with the objective of leveraging lessons learned for the benefit of TRIGO Staff and Customers.

6. Profile of users: who will contribute and who will benefit from the tool?

Answer: No differences among the user experience. Quality Consultants, Business Managers, Quality Managers and Inspectors will all benefit respective to their functions.

7. Will there be the different level of access for different profile of user for the tool?

Answer: No. Same user profile, same access for all.

8. Do you expect the customer to have access to the KM tool? Which level of access should they have? What functions should it fulfill?

Answer: No customers access. The internal tool to better cater customers needs, it may be used in a way to provide information regarding the progress of the assignment to the customer.

9. Should we focus on the tool solution? Should we also concentrate on the service support provider for its implementation?

Answer: Mainly the tool is necessary. Approach to its implementation will be appreciated.

III. Knowledge Management in TRIGO

10. Project lead by Peter Kiss 2 year ago

- What did not go well? Main issues?
- What are the results/ outcome achieved?
- Were there any other initiatives to implement KM?

Answer: These questions will be answered during the interview with Interviewee 4.

11. What is the functionality of TREQ platform? How can this platform contribute to Customer KM?

Answer: Actually, there's no concrete form of platform used for TREQ. There is only TREQ part in the current SharePoint.

12. What are the forms of reporting used by TRIGO inspectors?

Answer: Types of documents they have to fill in, for example, TRIGO has the inspection report template in quality system model.

13. What information does an inspector provide before/during/after accomplishing his mission? In which format (Word/ Excel/ PPT, etc)? Which tools does he use for each of the step?

Answer: The inspectors use the inspection report template if there is no an imposed service standard from customers. It can be any format based on different tasks.

14. What are the IT tools used to implement Quality Tools (Methods) such as 8D, FMEA, 5P, Ishikawa diagram, etc.?

Answer: Currently, TRIGO has SharePoint, OneDrive.

15. Is there relevant information we need to know about Stream5?

Answer: It's about the network of inspectors doing the inspection at Airbus suppliers. They're working especially for the cabin parts to inspect all the suppliers specialized in the cabin parts, not structure nor engine, but cabin. There are around 30-40 inspectors all around the world. To be precised during the interview with Interviewee 7 and Interviewee 8

16. What is Antifog (Automotive industry)?

Answer: Antifog is an operational tool internally developed to count the parts inspected. This tool is out of the scope of this project.

17. Do you have an intranet for the employees? What are the functionalities of the intranet related to KM, if it exists?

Answer: Currently, SharePoint acts as the intranet for the employees. the main functionality of this intranet is to share documents within the TRIGO team.

Interviewee 3

Role: Change Management Project Manager

Industry: Automotive Business line

I. TRIGO culture of change with IT tools:

1. Is there typical approach to change in the company?

Answer: The evolution of Antifog from version 1 to 5 showcasing massive evolution reflects internal momentum and dynamic. Changer Manager are catalysts, acting as vital intermediary between parties involved.

2. Is the workforce sensitive to the changes of IT tools?

Answer: Yes they are, dedicated pilots are in charge of accurately understand needs and contribute to improved IT solutions.

3. Are there adaptations to consider depending on the different geographical areas and their advancement as IT users? (Different level of IT development of regional teams)

Answer: Global implementation strategy will consider IT fluency, deployment takes place in most IT competent countries. Tools are aimed to be standardized, in some cases adaptation is required, mostly regarding local legislations needing special features.

II. Experience with Antifog:

4. How did it proceed? Actors involved (internal and external)? Strategy?

Answer: Antifog was internally developed starting in 2001. The fourth version featured 7 databases for each country an aspect that needed improvement. In 2015, version 5 became conveniently accessible with web based platform featuring a unique database, relieving employees from the constraint of software download and confusion due to several databases.

Actors involved:

- IT managers (in charge of relation with supplier)
- Project Managers (coordinating specifications of the need, training, communication and overall implementation strategy)
- Country pilots (local representative for implementation strategy with training, communication)
- Key Consulting (External actor since V5, Software Developer & Maintenance provider)
- Other actors (Quality managers if judged necessary)

5. What were the main phases?

Answer: We can distinguish roughly 5 steps:

- Need analysis (workshops to explain needs + listen to potential suggestion of the supplier)
- Price estimation & negociation
- Technical specifications & Software Development
- Testing on UAT test platform with selected test users
- Implementation via country pilots

6. Who created the training module for the software?

Answer: It was externally developed by Key Consulting.

7. Was the adaptation strategy to the new tool different depending on the country?

Answer: No the same approach is applied. Differences can only be found in special features for a certain countries. (see question 3.)

III. KM implementation:

8. How would you envision the success of this change?

Answer: A cascading process from selected countries to a global adoption of the tools while ensuring the user mastery of the tools.

9. What advice would you give for its implementation?

Answer: It was challenging to break the habits of users going from V4 to V5 of antifog which is why pre-launch communication is vital for success to make all users aware of the impact of change.

10. Which departments should be involved? (IT, HR, Management)

Answer: The more the departments involved (actors mentioned in question 4) the more effective will the change campaign as this brings awareness, momentum and credibility.

11. Would the change be presented the same way to the 4 groups of users profiles? (Quality Consultants, Quality Managers, Business Managers, Inspectors)

Answer: No, as they have different use for the tools the benefit of change should focus on their dedicated interest to be more convincing.

12. What incentives can be used? For what? Would it be applicable in this scenario?

Answer: One of the first step would be to identify the pilots of the different user profiles (from Quality Consultant to Inspectors).

Two sides to consider for TREQ:

- Laurent Defer (QEC) Quality Expert Consulting side
- Yann Lopez (RES) Resident Engineer side

IV. Current & Ideal KM tools

13. What KM tools do you use?

Answer: For now, Sharepoint despite limitations has undergone recent improvements. A customer portal in V6 of Antifog for external communication such as relevant information concerning ongoing client assignments (ex: real time audit process available on smartphone).

14. From your point of view, what are the advantages and disadvantages of the existing KM tools?

Answer: Sharepoint has the advantage of being already established internally, however it shows limitations in terms of files management and categorization. Further possibilities, benefits and limitations of Sharepoint are to be analyzed with an interview with *Naji Saadaoui* (example: possibilities of a search option).

15. How would you describe the ideal tool for internal customer knowledge management?

Answer: It should be simple and efficient. It should support users during their mission by featuring easy access, precise categorization, relevant numbering, automatic versioning and maybe provide internal communication as an animated/interactive platform.

16. What functionalities would you consider the most important ones?

Answer: An animated library providing effective versioning of files, multiple users accesses and personalized categorizations by user type. If the initial involves only specific actors such as Quality Consultant, then a forum is an essential add on to increase communication contributing to the utility of the tool in case information sought is not available or outdated.

17. What could be the main search criteria/categories?

Answer: Mission type/nature of activity (for example: audit, control, firewall, training) is most suitable criteria that would benefit all users. This categorization may be adapted to the distinctive need of each user type from Quality Consultant to Inspectors.

Interviewee 4

Role: Quality Manager

Industry: Automotive Business line

Prominent automotive sector:

1. What is the current tool used for KM? Who is the provider?

Answer: 3 years ago confluence, a team collaboration software was used as an internal sharing portal with its dedicated library and categorized sections such as “Know-How” and “How-To”. Today we use more the Case Studies system, it is managed by the Marketing dept, it is up-to-date, continuously refreshing and also template based. SharePoint as a Knowledge Management tools, with a global business intelligence interface.

2. Which criteria are used for the classification of data?

Answer: For Confluence, the data is classified into several sections of the library, each section is referenced by a release date, a unique file ID, a file name describing the nature of the document and field of activity (ex: Inspection of transformer tank, EPMS testing, etc.). For SharePoint, the interface features a list of activities linked to

competences (metal processing, Stamping, Welding, Assembly, Painting, etc.), the result is a short list of matched employees contacts with their name, country and city location.

3. What are the main differences in terms of KM between aerospace and automotive industry? (differences in KM needs, actors, process, etc.)

Answer: The automotive business line at TRIGO is roughly 18 years old, it has accumulated considerable quantitative and qualitative knowledge, its main current challenge is to articulate knowledge in order to not only sustain but more strategically to innovate the quality approaches using our historical experience. The aerospace business line is much more recent despite its differences it could highly benefit from the best practices of automotive.

4. Any proven best practices that could be beneficial for aerospace industry?

Answer: Automobile industry has extensive experiences in pacifically acquiring companies and merging their quality management systems with existing internal ones (keeping two complete systems is inefficient). This has implications with KM because of the challenges of Knowledge Transfers requiring intense benchmarking, collaboration, and evaluation. A standard process of Know-How transfer has been defined to create synergies both on a system, knowledge and practical level. This specific field of activity has now been delegated to TREQ who can apply the concept between internal business units.

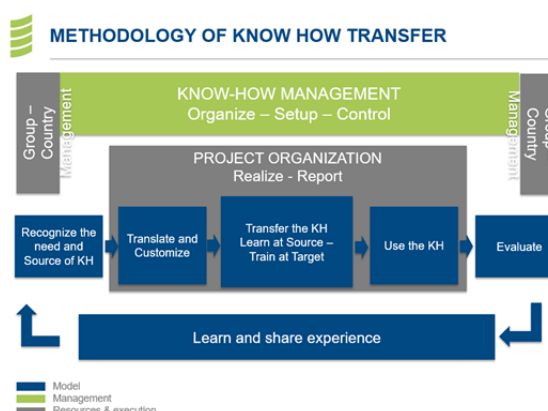
5. Any return on experience procedures commonly shared with aerospace?

Answer: The procedures share the same goal. Knowledge in its raw state is a sophisticated theoretical understanding of a subject. TRIGO interest is to transform it to a simple practical state that can be capitalized as valuable assets empowering its manpower and could also be sold externally as part of our service bundle.

6. What are the different phases of these procedures?

Answer: The phases of know-how transfer

- Recognize the need and source of KH
- Translate and customize
- Transfer the KH, learn at source and train at target
- Use the KH
- Evaluate
- Learn and Share experience



7. What features should a KM tool possess?

Answer: The tools should facilitate cooperation between operational managers, not only in terms of data but also in terms of people. If someone needs something it can check if solutions are internally available elsewhere in the world within the network. Being aware of possibilities in each country, having direct link to these people and their competences is key.

8. What are your current KM tools strengths and weaknesses?

Answer: Till now, there are still two different SharePoint for the American and European Market, it may be possible to have one consolidated SharePoint in the future. For the automotive business line we now have sufficient data but we encounter some difficulties to map it, there are features to search the platform for specific keyword by the challenge remain in navigating efficiently inside a file as well as managing languages (some documents have thousands of pages and only few languages available).

As a quality manager:

9. Who will benefit, contribute and manage the tool? Are there different levels of access?

Answer: There should be different level of access, I believe quality managers should bear the responsibility of managing the platform both in terms of files input and output. Quality manager should communicate the necessities to their underlying teams as training modules and support. On the other hand, the tools should promote transparency for the benefits of centralized activities such as marketing, human resources, among others.

10. Which document format would you provide in the system?

Answer: Usual formats (words, excel, pdf, databases, etc.)

11. What are the main obstacles that you would advise us to take into account?

Answer: Sometimes the Know-How transfer concerns direct customer demand (comes with assured revenue) in some cases it's only from potential customer (development project that have no revenues assured behind, may be considered as risky investments). As a question mark, should we capitalize on these fields or no? This will be a barrier toward expansion of the platform.

12. Any tips for an implementation strategy? Main phases to consider?

Answer: A country by country approach could be effective. Support from upper management is really important, when dealing with risky projects nobody wants to be part of the risk which is why sponsoring is key.

Aside the internal purpose of KM, to cater the client:

13. Could you explain the principle of “customer web portal” that you use?

Answer: Customer web portal enables easy interaction with customer on ongoing assignments. The end goal of a CKM tool should act as a differentiator from competitors (ex: LED TV's may be comparable in terms of hardware but the customers loyalty may reside on the intangible interface of such TV that facilitate its use therefore generating a perceived added value).

14. Is customer web portal linked to other internal KM tools?

Answer: Yes, in a very restricted manner. Customer Web Portal is very tricky because of the huge information that could be made available to customers, there are confidentiality dilemmas, the biggest challenge from an IT perspective is to impose restricted access.

15. How could the CKM system be used to better cater customers need?

Answer: Even if TRIGO is a smaller scale organization, car manufacturers expect their service providers to have the same level of knowledge as them in order to acquire the outsourced quality management activity. These set of expectations are reflected on agreements as requirements imposed on internal KM processes to enable a flawless hosting of TRIGO employee.

Interviewee 5

Role: Director of Aerospace and Business Development in North America

Industry: Aerospace Business line

Scope of activities:

1. Could you tell us about your role as Director of Aerospace and Business Development for North America?

Answer: TRIGO has recently bought PIC Group with the goal to expand its operations in North America and to get access to the quality services network in the Automotive industry. Next step today is to expand activities in North America Aerospace market, which is the largest in the world, and James was invited to direct this activity. His responsibilities as a Sales Manager include attracting new customers, executing contracts and delivering services to the customers in the region as well as supporting business activities in Europe linked to the business practices in North America.

2. What are the main goals and tasks of your consultant's network you are working with?

Answer: The main objective is to grow a network of talented consultants to deliver the services to the customers in North America in Aerospace industry. Acquisition of PIC Group helped to get access to the large network in the automotive industry. Engineers in quality in Automotive can provide a significant support for future network of aerospace inspectors, especially being driven by data sharing on the consumers' side.

3. How do you share information within your network in the USA? With other teams globally?

Answer: Today for both Aerospace and Automotive sectors TRIGO does not have a common established system to manage data globally. With every separate M&A comes a separate data management system. In North America a system to manage quality activity in Automotive industry is called EPIC, which is a sort of equivalent of Antifog system in Europe. Moreover, a lot of Aerospace customers use their own ERP system, so TRIGO in North America sometimes do not have access to some data in Europe.

KM tools:

4. Which KM tools do you use? What are the main processes related to KM tools and their main functionalities? Are they managed internally or by an external provider? Which type of data and classifications for the data are used?

Answer: SharePoint is the main tool for Internal KM data sharing. However, due to the historical reasons in North America PICO SharePoint is used which is not linked to TRIGO SharePoint in Europe. The current trend is information transfer from PICO SharePoint to TRIGO SharePoint in Europe. Inside the tool folders are sorted by different sections. For example, there are separate sections for Automotive and Aerospace industries, for marketing and sales. In general, it is a standard document management which has been implemented by now. SharePoint was developed internally, but the internal servers are managed by the third parties. Further development by an external provider could be helpful in the future. One of the needs of TRIGO today is strategic data sharing across Aerospace, Automotive and Heavy transportation industries, especially from the systems network side. It would bring more cross-selling activities: not just performing inspections activities but also developing and increasing performance activities.

5. What are positive and negative aspects of existing KM tools?

Answer: SharePoint is a powerful tool. It is better than network hard drives (internal server), as it is more developed in terms of search capabilities and data management. It has also more flexibility for user access rights. It is possible to create user groups and thus manipulate and better control individual users: give restrict access, read only access, short time access, etc. Yet, not all potential of SharePoint has been exploited yet. As for the negative points, it represents an old-fashioned way of managing information (network drives and folders). Another problem is slow upload speed. With regards to EPIC and Antifog systems, these systems need to be directed towards more high level inspection activities, even going beyond inspections towards quality engineering and development.

6. From your own experience, would you recommend some other KM tool applicable for TRIGO global network?

Answer: In the previous company (Verify) network hard drives and SharePoint were used, but it was not very efficient. So, a new ERP system was implemented internally by the company in order to centralize the information. Yet, it did not go well and even

made things worse, as it led to more decentralised information. There was an attempt to create a Wiki site for employees to input the information and centralize it, which can be a good idea, but it did not go well as well, possibly due to bad implementation and bad management of the tool. Another tool that James would advise is Customer Relationship Management (CRM) systems. It is a great way to collaborate around an engagement or a specific topic, especially for an account manager. Today CRM is mostly used for sales engagement, but ideally it would be very effective if operational data could be managed by CRM systems in the future as well. KM is about having as much data shared as possible, so having Sales as well as Operations involved is very important.

7. Can you describe an ideal tool for Internal Customer KM for your network?

Answer: Sharing business information effectively is necessary, for example, exchanging information about how much profit a particular department/team is making for a specific project. This type of data is very important to make strategic commercial decisions. From operational perspective, information about defects, the actual results of the inspection engagements as well as the processes used for each project by different clients, what worked well or not well – all this should be accessible. In which form? It can be a report or dashboard. Having a web tool that is able to produce automatically the reports, graphs and charts is highly beneficial. Yet, Excel is also a very powerful tool. A standardized way of working with different clients should be established to be able to share and compare the results of our work for different customers and for the same supplier, for instance.

8. What functionalities would you highlight as the most important ones for the Internal Customer KM tool? What main search criteria would you define to categorize the data?

Answer: The typical filters that we could apply would be by industry, customers, supplier, product family, defect type, etc. It will be highly beneficial for TRIGO to develop a standardized list of categories for data management. However, different customers propose different categorization list, so TRIGO has to take the customer specificities into consideration. It is important for the system to be flexible, as it should be able to fit into the customers ERP and MRP (Manufacturing Resource Planning) systems as well. The consolidated centralized system should include multiple user profiles as well

as recognise specific needs of different users. It is also important to maintain different level of access to for different employees from the user perspective (by role, by person or both). Different type of information should be available and visible for customers (for ex. milestones, defect rates, objectives, project submissions), internal project teams and operations teams (for ex. information about cost and other key operational decisions), inspectors and suppliers (especially for source inspections). Using a standardized way of producing and sharing data from both industries so that it can speak to common set of identifiers is really essential to maintain a centralized system.

9. From your point of view, which constraints in terms of implementation should be taken into account?

Answer: Firstly, the problem of space allowed to store data. For instance, some images can be quite “heavy”. Furthermore, there can be some intellectual property issues related to producing and sharing pictures inside the network. One of the existing constraints of data sharing - no common language. English is an official language, but it is not always used by the employees. With fifteen different languages it is difficult to share information. There also differences in the version of the hardware system used by the teams globally that should be taken into consideration. Especially, it concerns working with customers who may have the latest version of Microsoft Office. Change management is an important issue. Training and communication is essential.

10. What could be the strategy and main phases of KM tools implementation?

Answer: In software development a big problem is scope creep. Incremental, progressive development and implementation which responding to different customers’ needs will pay off. Yet, the baseline for inspectors and customer platform system should be there for the initial release.

Internal inspectors versus Freelancers:

11. Your colleague Mr. Pomar told us that you were working not only with internal inspectors, but also with freelancers. What are the main differences in terms of KM practices between internal employees and freelancers? Challenges related?

Answer: Freelancers have a restricted access to the TRIGO portal and can access less internal data than an internal employee. It is specified in the contract for which type of information a freelancer will have access. Besides that, it is stated that

freelancers have to input a specific type of information in the system of TRIGO in a certain way, and their input is expected to be the same as the internal employees would make. Is this requirement effective? – Yes and no. There is still no procedure on how to ensure that freelancers share as much data as they can. The challenge comes from the fact that it is difficult to find professionals with good expertise in this domain, so freelancers know that they have much power and can use it.

12. Do you have different KM tools used by internal employees and freelancers?

Answer: No, they use the same platform as internal employees with a more restricted access.

Interviewee 6

Role: Contract Manager for U-Shin project

Industry: Automotive Business line

Scope of the activities:

1. What is U-Shin project? Is it aerospace or automotive industry? How many countries are involved in the project?

Answer: U-Shin is an international company that supplies automobile parts for various automobile companies. U-Shin is not part of TREQ organization.

2. Could you tell us about your network of quality resident engineers/inspectors? Which industries are they working in?

Answer: Quality residents act as customer representatives in host manufacturing plants. There is at least one resident for every car manufacturing plant in Europe, which is the same for U-Shin's suppliers around the world. Regarding engineers, they are from TREQ department and are assigned for missions that requires specific expertise or to fulfil pinpoint services.

3. What is the role of quality residents from the resident network?

Answer: the quality residents normally act as a link between U-Shin plant and the car maker plant. Normally, U-Shin builds an assessment system for vehicles and inspects wide range of parts e.g. handles, engine door latch, latch for fuel doors, etc.

4. Could you explain the current procedures related to the U-Shin project?

Answer: Its main missions include: 1.) manage quality residents who are hosted at sites in different areas, 2.) U-Shin can assign residents to do services outside of their routine works, e.g. participate in meeting, present data on the parts.

Existing KM tools:

5. What current KM tools do you use to spread knowledge and share information within the network? Is the service provider from internal/external source?

Answer: Currently Google Drive is used for daily operations and referencing issues for U-Shin. Even if SharePoint is established, few team members use it on a regular basis, therefore data remains outdated. Moreover, there are some access issues: some users have limited access for SharePoint. “Red Daily Report” (RDR) is an initiative integrated in SharePoint which provides ready-made forms to be filled in. However, the residents are more familiar with Google Drive than SharePoint. For comparison, Google Drive is quicker than SharePoint in terms of downloading or uploading speed. Furthermore, time spent on transferring documents on SharePoint can be one of the factors that makes the transition undesirable. Google Drive remains easier to use.

6. What types of information do they share? How do they manage information?

Answer: the training files, invoicing files, RDR examples, databases, test. All these types of information are managed by resident manager who send files such as training modules directly to the residents.

7. What are the main functionalities that are the most important ones from your point of view? What are the formats and classifications of the data shared?

Answer: main functionalities are the ones featured by Google Drive and Red RDR. Google Drive is used to download and share files. The formats of files are in PDF to be conveniently accessible by smartphone for example, which is very important in order to ensure that people can open files on any device they use.

8. What are the advantages and disadvantages of the current KM tools from your point of view? Is there any error/mul-function?

Answer: regarding the advantages, the Google Drive is the tool that everyone is accustomed to, it is more efficient in downloading or uploading the documents with

higher speeds. For the disadvantages, security issues needs to be considered. At the moment, resident managers give access to some people but a more secured platform would be appreciated. Moreover, language barrier is another problem for residents.

9. Are there any concrete examples for the knowledge management problems?

Answer: Current tools do not allow the resident managers to ensure that residents check the new documents or guidelines by themselves. Another minor point is that Google Drive doesn't work in China.

Ideal KM tool:

10. How would you describe your ideal KM tool? What about the functionalities? How should the data be classified?

Answer: The ideal tool should be autonomous, without requiring a lot of human interventions. It should have the capability to allow all residents to exchange information on common mistakes, frequent issues encountered on past missions, as well as self-learning materials. Automatic generation of documents should be possible by providing an extensive list of template for the reports to be filled directly in the online mode. Databases compatibility to support special activities apart from the quality management, e.g. parts presentation, meetings, etc. Thirdly, it should have an automatic generation of KPI's.

11. Since your project is operated worldwide, are there any obstacles related to the global scale for your activities that prevents your network from successful functioning?

Answer: Currently, there are some obstacles. For example, the platform doesn't have the full support for the Excel files regarding the capabilities in terms of features and formulas. Furthermore, there is a problem related to security of the documents. Even though Google Drive works, but it cannot be improved.

12. What are the main search criteria that you would define to categorize the data?

Answer: Any type of sorting can has its advantages depending on the different profiles of the users. Files can be categorized based on types of problem, typologies of incident, e.g. the database should have training area, work area, feedback, analysis of activities and so on.

Interviewee 7

Role: Project Manager for Stream5 project

Industry: Aerospace Business line

Interviewee 8

Role: Contract Manager for Stream5 project

Industry: Aerospace Business line

Scope of activities:

1. What are the different roles of Contract Manager and Project Manager in Stream 5?

Answer: For Stream 5 project, Contract Manager (Program Manager) works for the business line of aerospace and sales force for the countries that have no local sales force. Project Manager is responsible for the specific activities including an incoming quality inspection (parts controlling before delivering to Airbus and bringing them to the assembly line). In total, there is a team of 45 inspectors for cabin, 20 inspectors for airframe and 1 Quality Manager for Airframe working at seven Airbus sites.

2. What is Stream5 project about?

Answer: The objective of Stream 5 project is to secure Airbus final assembly line by ensuring the quality of the components which are being delivered by the suppliers.

3. What is the scope of Stream 5 project?

Answer: The scope includes two main areas of activities: quality control of the cabin equipment as well as quality services for airframe, structure and subparts.

4. How do you share knowledge among the inspectors on the global scale?

Answer: There are two main ways of sharing data inside the team. SharePoint is mainly used for the inspectors network to exchange documents on the project on a daily basis. For the moment, it includes sharing monitoring system and some indicators. "Transnat" internal server (network hard drive) is used by quality managers to share more sensitive and more confidential data. Since the server can be accessed from only from inside, SharePoint is a more flexible solution. At the end, it is good to maintain both of them.

5. How do you share data with the client?

Answer: The data is entered in the Airbus SharePoint which is called “Ishare”. Yet, in order to access the system the team should be physically present at Airbus site and have access to the system of Airbus. By contrast, Airbus does not have access to TRIGO SharePoint. Some files are also sent by emails to the client.

6. What is the purpose of Customer Web Portal?

Answer: Interviewee 7 and Interviewee 8 do not work with Customer Web Portal.

Existing KM tools:

7. What current KM tools do you use? Is the service provider from internal/ external source?

Answer: The current tools used by the team are Transnat internal server and SharePoint. SharePoint is the most flexible tool to share the information at the moment. Interviewee 7 manages the structure of SharePoint and provides access rights for the inspectors to the data they may need for their job. SharePoint is used mainly to exchange current documents inside the inspectors’ network as its storage space is limited. If there is a need to increase the size, Interviewee 7 needs to contact the IT department. As for internal server, the team use it to store the necessary documents for the project, as there is more storage space and it is easier to extend it as it is managed fully internally.

8. What types of information do you share? How do you manage it?

Answer: All types of information related to the current project in the format of Word, Excel, PowerPoint, PDF. There is no pictures shared separately from the documents at the moment, yet, a picture library may be beneficial for the operation in the future.

9. From your point of view, what are the advantages and disadvantages of the current KM tools? Is there any error/mul-function?

Answer: As for SharePoint, although it is a good tool to exchange information as the team can share data very easily, yet there are some limitations. There are 2 major inconveniences today. Firstly, its performance is dependent on the internet speed which can lead to an inefficiently uploading or downloading process which make take a lot of time and it prevents people from accessing the documents. Second limitation is in terms

of the storage space accessible in SharePoint. The platform is good for exchanging up-to-date documents, but not for the storage. So, a backup solution is required to ensure that the SharePoint will be available every day for the team.

SharePoint still cannot allow automatic update by itself. People have to spend some time to ensure that all the documents are up-to-date, that there is only the last version uploaded (“cleaning” of the files) and the previous old versions are stored on the server - a lot of manual work. Moreover, Interviewee 7 and Interviewee 8 are not expert in the SharePoint, so it takes time to discover how the tool works and to explain to the inspectors its functionalities, where they can look for the documents, etc.

10. Are there any required KM service standards from the customer?

Answer: there is no any specific standard required from Airbus. What Airbus wants is the same level of service on the sites both in Toulouse or Germany. The customer would like to see the results, but does not care about how the knowledge and data are shared inside the network.

Ideal KM tool:

11. What is your ideal tool for internal customer knowledge management to solve the present problems? What about the functionalities? How should the data be classified?

Answer: Experience sharing and lessons learnt among the inspectors could be helpful for the team. The knowledge that should be shared include instructions for the inspectors in terms of what are the expectations from TRIGO and customer sides. The possibility to receive feedback for the work done from the inspectors side could be an opportunity.

Facebook-looking interactive KM tool may be good to share knowledge. “Yammer” can be an example of business platform integrated in SharePoint (Microsoft Office application). This interactive platform serves as a communication tool for exchanging the messages, uploading photos etc. Yet, there is a threat that it can turn into personal use rather for professional use.

The system that would inform the inspectors automatically about the new documents uploaded would be highly beneficial. Yet, it is difficult to ensure that people

have read the shared data properly and can use the knowledge received by self studying. Thus, face-to-face meetings and trainings are still necessary.

What is important to highlight is that when introducing a new tool or new functionalities it is mandatory ensure its smooth implementation. It includes having a clear view on who will animate the update of documents, which type of data will be shared, to which Quality Management process it will be linked and what will be the interest for all the stakeholders to use the tool. So, to guarantee the successful implementation, the process of adaptation for the tool usage inside the network is necessary. This will help to making the system live together with a parallel challenge of deploying the tool.

12. Since your project is operated worldwide, are there any obstacles related to the global scale for your activities that prevents your network from successful functioning?

Answer: There are the differences between the SharePoint of TRICO and of PIC Group that has been acquired recently. They use different Microsoft accounts and that is why the SharePoint in the US and in Europe are different and not connected to each other.

13. What are the main search criteria that you would define to categorize the data?

Answer: The categorization for search should be defined by the industry, the product family, the type of job, instructions related to different fields such as IT (for ex. for SharePoint) and so on. An important area to share would be customer specifications. The tool is important but the processes that will support the performance of the tool should be taken into account.

Appendix C: Comparison Table for Interview Results

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Interviewee 7 & Interviewee 8
Scope of Activities							
-Title	Global Resident Engineering Service Manager (TREQ)	International Sales & Key account Manager	Group Change Project Manager	Quality Manager	Director, Aerospace & Business Development, North America	Contract Manager U-Shin (TREQ)	Project Manager & Contract Manager Stream5
-Industry	Aerospace, Automotive & Heavy Transportation	Aerospace & Heavy Transportation	Automotive	Automotive	Aerospace	Automotive	Aerospace
-Role/ Relevance	-Set up a strategic roadmap for TREQ -Collect footprints of TRIGO businesses	-Supervision of projects and sales activities in Germany, China, Morocco and Turkey	- Implementation of Antifog in multiples countries -Insight on IT evolution -Coordination of trainings -Coordination of country pilots and communication -Development of Customer web portal	-Lead in KM project 2 years ago -More than 10 years of experience in quality in Central and Eastern Europe -Exploit the accumulated data in the auto business line to innovate quality processes	-Worked for 10 years for competitor Verify as a Sales manager -Grow Aerospace quality inspectors network & attract new customers in NA -Support activities in Europe -Manage freelance network -Synergies between automobile & aerospace industries in NA	-Manage the quality resident hosted at different sites -Build assessment system for vehicles and inspect wide ranges of part -Assignments for quality resident service	-Project manager: responsible for incoming quality inspection and parts control -Contract manager: works for the business line of aerospace and sales force for the countries that don't have local sales force -Quality control of the cabin equipment, quality services for airframe, structure and sub-parts
Current KM tools							
-KM practices (data shared internally)	-Case Studies -Sharepoint	-SharePoint -OneDrive	N/A	"Know-how" platform based on Confluence (wiki platform)	-PICO SharePoint, not linked to TRIGO SharePoint in Europe -Internal server	-Google Drive for daily operation and referencing issues -SharePoint (rarely) -Red Daily Report development	-Transnat internal server (store confidential information) -SharePoint (exchange recent documents) -Yammer(app. for SharePoint)
-KM practices (data shared externally)	N/A	N/A	-Customer Web Portal	-Customer Web Portal	N/A	N/A	- Jshare (Airbus SharePoint)

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Interviewee 7 & Interviewee 8
-Service provider (Internal/ External)	Sharepoint-external provider, but managed internally except the storage space (external server) Transnat internal server –internal network hard drive Customer Web Portal-developed internally Google Drive/OneDrive-external cloud-based solution						
-Contributors & Beneficiaries	-Project managers -Business managers -Marketing dpt.	N/A	-IT managers -Project managers -Country pilots -Quality manager -Quality inspectors	-Quality managers -Quality consultants -Quality inspectors -Shared services (Marketing, HR, etc.)	-Business managers - Internal Quality inspectors & freelancers (limited access)	-Project managers -Quality resident managers -Quality Residents	-Quality managers (Transnat server & SharePoint) -Quality inspectors (SharePoint)
-Data Management	-Case Studies system managed by Marketing dpt.	N/A	-Customer Web Portal: invoicing and real time update on ongoing assignment	-Sharepoint: common files and global intelligence for skills -Confluence 3 years ago with know-how and to do libraries -Case Studies system managed by Marketing dpt.	-Simplified document management: File directories for different sections	-Google Drive used for sharing files with the team -Producing reports through Red Daily Report application	- SharePoint: project manager share data and manage level of access for inspectors
-Type of data shared (nature & format)	-Case Studies -Footprints	-Inspection report templates	-Invoicing, accounting	-Case studies -Templates -Database files -Employee names, location, contact according to field of activity	-Dashboards, reports	-Training files, invoicing files, RDR files -PDF files are accessible by smartphone	-Word, Excel, PPT, PDF -All types of information related to the project
-Advantages	Case Studies/Confluence: -Well-structured -Standardized templates -English as common language	SharePoint: -Well-established -Available and accessible to all employees in Europe	Sharepoint: -Well-established -Available and accessible to all employees in Europe	N/A	SharePoint vs Internal server: -More search capabilities -More flexibility in term of user access rights -Powerful tool, do not use all the potential	Google Drive - User friendly - Higher speed for uploading documents than in SharePoint -History for document modifications	SharePoint: -Easy data sharing & exchange Transnat server: -High level of security -Higher storage space capacity -Reactivity, no internet dependency
-Disadvantages	Case Studies/Confluence: -Lack of automation -Not dynamic	SharePoint: - Inefficient search by keywords -Not possible to use multiple criteria to manage documents	SharePoint: -Limitations in terms of files management and categorization	SharePoint: -Difficulty of mapping all the data -Hassle for intra-document search	SharePoint: - Inefficient search by keywords -No multiple criteria search -Slow speed -Storage space limitations	Google Drive: -Blocked access in China -Not support fully support day-to-day activities -Limited functionality of Microsoft Office pack -Security issues -Storage space limitations -No automatic alert notifications	SharePoint: -Slow speed -Storage space limitations
-Constraints	N/A	-Constant process of M&A leads to incompatibility of KM tools across subsidiaries	N/A	-Different SharePoints between NA and Europe -No common language used	-Missing data as customers use their own ERP system in Europe -No common KM	-Language barriers -No centralized system, common standards & procedures for	-Lack of training for SharePoint

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Interviewee 7 & Interviewee 8
					<ul style="list-style-type: none"> tool to share data between NA and Europe -No common language used -Different hardware systems -Different levels of IT users proficiency 	data management	
Ideal KM Tool							
-Description	<ul style="list-style-type: none"> -Play a role of a personal assistant in the daily work -Act as a dynamic database 	<ul style="list-style-type: none"> -More developed intranet -Progress tracking of the mission assignment for the customer 	<ul style="list-style-type: none"> -Simple and efficient -Support users during their mission -Easy access - Standard categorization -Automatic versioning - Animated/interactive platform (internal communication) 	<ul style="list-style-type: none"> -Should facilitate cooperation between operational managers -Articulate teams, resources and know-how on a worldwide scale to efficiently fulfill assignments -Provide awareness of resources and capabilities within the global network -Transform theoretical knowledge into new services 	<ul style="list-style-type: none"> -Strategic data sharing leading to cross-selling activities -Contribution to the standardization of processes & data management -Customization of the tool if required 	<ul style="list-style-type: none"> -Efficient without human intervention, autonomous -Auto generation of materials -Easily accessible & user friendly -Database with support for all activities including special assignments for quality management services -Facilitate inputs from inspectors & residents -Full support for Excel files 	<ul style="list-style-type: none"> -User friendly -Autonomous -Facilitate experience and lesson learnt sharing -Require backup solution to ensure the flow of everyday works -"Facebook-looking" interactive KM tool
-KM Tools examples	-Bosch BGN intranet	-Business applications for SharePoint	N/A	N/A	<ul style="list-style-type: none"> -CRM based interactive systems -Wiki 	-SAP	-Yammer
-Functionalities of KM tools	<ul style="list-style-type: none"> -High reactivity and speed of the tool -Skill matrix -Encrypted emails 	<ul style="list-style-type: none"> -Possibility to login in the website with TRICO id password -Database for many specific tasks that has a link to documents. -Search by keywords -Same level of access -Same users profiles 	<ul style="list-style-type: none"> -Animated library -Effective versioning of files. -Multiple users accesses - Personalized categorizations -Forum to increase communication between quality consultant 	<ul style="list-style-type: none"> -Centralized system for data sharing and common data management procedures -Multiple user profiles with different level of access -Accessible to centralized services such Marketing, HR, etc. 	<ul style="list-style-type: none"> -Centralized system for data sharing and common data management procedures -Automatic generation of reports, graphs and charts -Multiple user profiles with different level of access -Accessible for both external and internal users -Able to speak to customer ERP and MRP systems -Big storage space 	<ul style="list-style-type: none"> -Autonomous, not require human intervention to enhance its efficiency -Template for report and KPI auto generation -Database compatibility to support special activities apart from the quality management 	<ul style="list-style-type: none"> -Automatic alerts and notifications -Picture library may be beneficial for the operation in the future

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Interviewee 7 & Interviewee 8
-Type of data shared (nature & format)	N/A	N/A	N/A	-Training modules -Library (best practices, Templates for experience sharing, etc.)	-Business data (project profitability, etc.) -Operational data (actual results of the inspection engagements, processes for different clients, best practices & problems, etc.)	-Training files - Invoicing files -RDR examples -Database files - Collaborative space to share training materials, feedback from inspectors and lessons learnt	-All types of information related to the project - Instructions/ guidance for IT tools -Word, Excel, PPT, PDF
-Nature of classification	N/A	N/A	-Mission type/nature of activity - Categorization adapted to the mission/ client	-Content based indexing based on activities linked to competences (metal processing, Stamping, Welding, Assembly, Painting, etc.)	-Industry -Customers -Suppliers -Product type -Defect type	-Types of problem, -Typologies of incident	- Industry -Product family -Type of job -Customer specification
Implementation							
-Strategy	N/A	N/A	-Focus on pre-launch communication -Emphasize on user benefits	-Support from upper management -Country by country approach	- Standardization of processes & data management with a possibility of adaptation for the customer -Incremental approach	N/A	-Common standards & procedures for data management -Clear roles & benefits of stakeholders -Require adaptation of processes inside the network for tool usage
-Phases	N/A	N/A	-Test Beta version -Select appropriate pilot for each user profile -Cascade expansion from IT experienced countries	N/A	Change management: -Communication -Training	N/A	-Support system built around the tool & process adaptation

Appendix D: Benchmarking Table

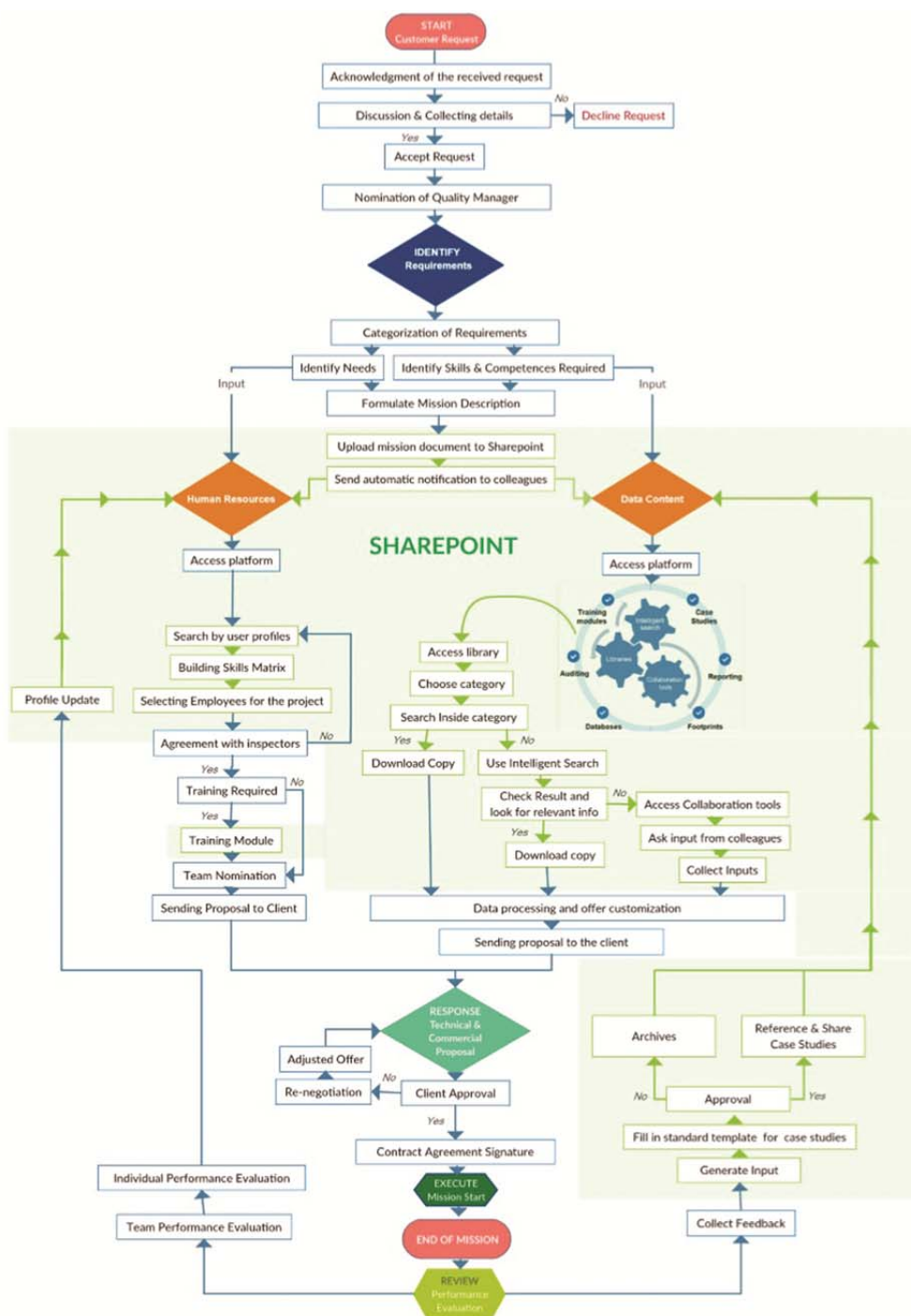
Tool Name & Criteria	Sharepoint 2016	Xwiki	Alfresco	Confluence	eXo Platform	TallyFox Tallium	Scoop.it
General description	Microsoft-hosted cloud service to store, access, share, and manage documented information from all devices	Web Based Wikipedia	Alfresco is an Enterprise Content Management (ECM), Web Content Management and Digital Image Management Tool.	Team Collaboration Software	All-in-one open-source digital collaboration platform that provides knowledge, document and content management, social engagement, and project collaboration tools integrated into your business's applications.	Cloud-based professional services automation (PSA) features includes modules for project, knowledge, document and resource management. It is a business ecosystem platform that improves knowledge exchange, content management and communication for the business community and stakeholders	Social media and content curation platform (associates a piece of web content with a curator on a topic together with essential meta data)
Clients	Altran, Safran, SII SOGETI, Nestlé, Kraft food, Monsanto, Segula Eurocielle.	Amazon, Citronoposte, Edf	Lafarge, Nasa, Cisco	SII, Safran, Altran, Facebook, Skype, Microsoft	Allen, UCLA, elysee.fr, HSBC, Orange TM, NATO OTAN, Johns Hopkins University	N/A	AKKA technologies, Altran, Capgemini Consulting, SAP, Renault Nissam, Docker
User Experience							
Permission levels	10 permission groups (Full Control, Design Edit, Contribute Read Limited Access, View Only Approve, Manage Hierarchy, Restricted Read)	Yes	Yes for sales, folders and files control who can view, modify and delete documents)	Yes (permissions and restrictions)	Yes (levels of permission can be managed)	Yes (support multiple levels of access rights to enable effective and easy collaboration)	Yes (content curation and contribution rights)
Smartphone Compatible	Highly developed, "intranet in your pocket"	Yes	Yes	Yes (Mobile - iOS Native but issues encountered by some users)	Yes (eXo Mobile can connect to eXo social intranet)	Yes (it has mobile apps that supports iOS Native, Android, Linux)	Yes (applications for iOS and Android)
Automatic Alerts	Yes (Auto-generated emails when a file or folder changes in a document library)	Yes	Yes (to be customized)	Yes (subscriptions autowatch)	Yes (and colleagues can leave comments about the updated)	Yes (comprehensive notification settings real-time tracking of individual and group progress and work on project)	Yes (daily notifications by emails)
Multilanguage	USA, UK, Canada, International	USA, UK, Canada, International, France	US English, German, Spanish, French, Italian, Japanese, Dutch, Simplified Chinese, Russian, Norwegian Bokmal, Brazilian Portuguese	UK & US English, French, German, Portuguese, Spanish, Korean, Japanese, and Russian	English, French, Arabic, Catalan, Chinese, simplified Chinese, traditional Czech, Dutch, German, Greek, Italian, Japanese, Lithuanian, Norwegian, Persian, Polish, Portuguese, Brazilian, Romanian, Russian, Slovenian, Spanish, Swedish, Turkish, Ukrainian, Vietnamese	USA, UK, Canada, South Africa, Europe, Asia, Australia, China, Germany, India, Japan, Latin America, Middle-East	USA, UK, Ireland, Canada, South Africa, Europe, Asia, Australia, China, Germany, India, Japan, Latin America, Middle-East
Communication Tools	Wikis, blogs, surveys, document collaboration tools, shared calendars, social network features	Forum, groups, comments & notes sharing	Chat room client integration	Brainstorming, Discussion board, cooperative writing	Discussion forum, chat, note sharing, features such as wikis, forums, calendars and documents are integrated around activity streams, social networking and workspaces	Advanced content mgmt. and communications with altoids to drive knowledge sharing, discussion board, document management, Wiki, full text search, self-learning	Topic pages sharing through branded emails, comment "wall" for the posts

Tool Name & Criteria	Sharepoint 2016	Xwiki	Alfresco	Confluence	eXo Platform	TallyFox Tallium	Scoop.it
Tool Management							
Service Support / Aftersales	Online helpdesk & training	Training, customization, data importation	Process integration, training, helpdesk, data importation	Live Rep. online, training with documentation	Full range of services offers, from inspection through implementation to maintenance and ROI; on-site and remote training	Treat clients as advisors on how to make the software more efficient and relevant to client needs through online and business hours, training and documentation. We offer support options, various support options, includes FAQs forum, knowledge base, online support, phone support, video tutorials.	Training, call center, support by email
Storage Space	-10 GB max per file (varies depending on subscription package) -5,000 items in site libraries, including files and folders	Cloud (limited) & Local Server (unlimited)	Cloud (limited 100gb to 400gb) & Local Server (unlimited) Alfresco in the Cloud offers: Standard Edition Up to 50 users. Only 25 GB of storage is available with Amazon Web Service.. Enterprise Edition Up to 500 users - 1 TB of storage available with Amazon Web Service..	Maximum storage available for each Atlassian Cloud site is 25GB	Cloud (limited) & local server (unlimited)	Cloud up to 100 GB, the platform is hosted in a secure private cloud	Cloud 30 MG per document (100 uploads per week)
SaaS (Software as a Service)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Licences	-Licence SharePoint Standard CAL (Communities Content, Sites, Search) -Licence SharePoint Enterprise CAL (+Business Solutions and Business Intelligence)	The GNU Lesser General Public License (LGPL) is a free software license allows the use and integration of software released under the LGPL into their own (even proprietary) software without being required by the terms of a strong copyleft license to release the source code of their own components.	Alfresco One Enterprise Edition is licensed under a standard commercial license	Developer licenses are free-of-charge to commercial license holders, they include 12 months of updates starting from the purchase date of the commercial license	Source license LGPL	N/A	No
Access for external users	Yes (link sharing)	N/A	Yes (create public sites)	Yes (permission basis)	Yes (permission basis)	N/A	Yes (link sharing)
Content							
MS Office	Latest office compatibility+Visio	Yes (only webpages but possibility to integrate microsoft office, upload, download and open attachments on the wikispaces)	Yes (ms office integration, 2010 and above)	Yes (Microsoft Office 2013 for windows 7 & 8 while Microsoft Office 2003, 2007, 2010 for Windows 7 & Windows Vista) No google chrome support for online editing	Yes	Yes	Yes
PDF	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mac	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Tool Name & Criteria	Sharepoint 2016	Xwiki	Alfresco	Confluence	eXo Platform	TallyFox Tallium	Scoop.it
Online editing	MS office documents Web pages templates	No (only wki pages, no direct support for attachments)	Yes	Yes (but only for documents in special Confluence format)	Yes (by eXo add-ons to edit eXo documents in Google Docs. Only some formats that are compatible with Google Docs)	No	No
Auto-Version	-Track history of a version -Restore a previous version -View a previous version	Yes (version control history)	Yes (document versioning, including full roll-back functionality, simplifies document tracking and protects file integrity)	Yes (built-in document version management)	Yes (the version history of documents can be managed through the user interface, automatic versioning)	N/A	No
App/ Add-ons/ Business systems (support or integration)	-Thousands of apps available, ERP, Business Intelligence Platforms, CRM, Enterprise Applications -Possibility to develop add-ons by your means (RDR)	Yes (Microsoft Active Directory, LDAP, Google Apps, Azure, Microsoft OneDrive, Atlassian JIRA, Elastic Search, Kiabna)	Yes (hundreds of add-ons available, Ephesoft, SAP, Amazon Web Services, SalesForce, Google, MS Office, Oracle, IBM i2, CAD, Citrix, Soft, Visual Works, ICC, MuleSoft, LifeRay, AcQuia)	Yes (thousands top rated add ons such as PDF Exporter, Calendar, Diagram drawer, Roadmap creator, Report generator)	Supports add-on and integration with these systems with Microsoft Exchange, Bonitasoft, Box, SharePoint, Alfresco, Apache Sirona, Bonita BPM, Box, Dailymotion, Dropbox, etc)	Yes (Tallium offers an API and integrates with these applications includes SharePoint, Dropbox, Google Drive)	Any system that supports API can be compatible (WordPress, Wix, Squarespace, Hootsuite, Google Analytics, Marketo, Hubspot, Buffer, MailChimp, Drupal, Joomla, Pardot, Eloqua, Facebook, Twitter, LinkedIn, etc.)
Search inside documents	Yes (Searches for keyword typed in file name, metadata and text inside of the files for MS Office and readable PDF files)	Yes (Soft Search Application enables to customize search precisely regarding the type of attachment, size, date of upload, language, etc...)	Yes (Opensearch feature)	Yes (Full search, filtered search, attachment type search)	Yes (full text search)	Yes (full text search, semantic search)	No
Categorization							
Standard vs Customized	50/50 Customised XSLT files used for Content Query, Summary Links, and Table of Contents Web Parts; template pages and add-on PerformancePoint Dashboard Designer	Yes (Topic Tags, links between documents, helps centralizing and standardization) / Yes (topic tags and valuable data using dynamic livetables)	Yes (Smart folders facilitate content discovery by grouping files based on what they are rather than where they're stored) / Yes (My spaces list, configurable my Alfresco dashboard that shows specific data)	Yes (Globalspaces are areas on your site into which you can group content items (pages, attachments, news, etc) based on any subject or topic of your choice. / Yes (Personalspaces belong to specific users and can be kept private, or opened up so the whole world can view and edit them, just like global spaces, customizable dashboard + potential add-ons)	Yes (full text search, semantic search)	Yes	Yes (Personalized content feed)
Additional Features							
Skill/Competences Matrix	Yes	Yes (recruitment add-on application)	No (need to integrate)	Yes (add-ons skill index, talent management)	N/A	Yes	No
Databases files	Yes	No	Yes	Yes (PostgreSQL, MySQL, Oracle, Microsoft SQL Server, H2)	Yes	Yes	No
Pictures	Yes (BMPfile, GifFile, JPEG, PNGfile)	Yes (as attachment)	Yes	Pictures(at least Jpg and Png)	Yes (by eXo Add-ons)	Yes	Yes (Png and Jpg)

Tool Name & Criteria	Sharepoint 2016	Xwiki	Alfresco	Confluence	eXo Platform	TallyFox Tallium	Scoop.it
Videos/Audio	Audio Video (AVI,flie, H.264, MP3, MPEG1)	No	N/A	Adobe Flash (.swf) Apple QuickTime (.mov) Windows Media (.wmv, .wmv) Real Media (.rm, .ram) MP3 and MP4 files (.mp3, .mp4) MPEG files (.mpeg, .mpg) AVI files (.avi)	N/A	Multimedia library, Video, links	Yes (sharing links)
Other files	Compressed (GZipFile, ZipFile, RARFile) Other (for ex. JavaClass)	N/A	N/A	N/A	N/A	N/A	N/A
Automatic Report Generation	Yes (to be developed with jsreport and using javascript and templating engines)	N/A	No (to be integrated with an add-on development e.g Activiti)	No	Yes (by using JasperReports that allow to produce documents that can be viewed printed or exported in a variety of formats such as HTML, PDF, Excel, OpenOffice and Word)	N/A	No
Price	50 users, 2 servers-20,000 € + monthly payments Sharepoint Server - starts around \$5,000 7,000 € per year Licence, SharePoint Enterprise CAL - around \$90 per one-time license per user Licence SharePoint Standard CAL - around \$180 per one-time license per user Sharepoint Farm: Plan 1 - \$9/user/month (includes support for small and mid-sized users) Modern Team Sites (External Sharing, Content Management, Portals, Mobile Apps, Workflow, Search) Full-featured SharePoint Online with capabilities for the enterprise (+Enterprise Search, eDiscovery, Excel, Visio, and InfoPath Forms Services) Connectivity Services (-Office 365 Enterprise E3 - \$20/user/month) All the features of Office 365 including Office apps and other services	50 users-1,000 €/year On Premise Pricing XWiki Bronze Subscription - starts at 500€/year (25 users or less) XWiki Silver Subscription - starts at 1,000€/year (25 users or less) XWiki Gold Subscription - starts at 5,000€/year (25 users or less) XWiki Platinum Subscription - starts at 10,000€/year (25 users or less) XWiki Cloud Pricing XWiki Silver Cloud - starts at 10€/month (10 users or less) and 1GB storage XWiki Gold Cloud - starts at 100€/month (25 users or less) and 20GB storage XWiki Platinum Cloud - starts at 400€/month (25 users or less) and 50GB storage	No specific price, invoice request Content Services Starter Edition Up to 100 Named Users Business Edition Up to 300 Named Users Enterprise Edition Up to 1,000 Named Users (Additional users can be added)	50 users-2,200 \$/year Host on your Server: 10 users - \$10 Starter 25 users - \$1,200 50 users - \$2,200 100 users - \$4,000 250 users - \$8,000 500 users - \$12,000 1,000 users - \$16,000 10,000 users - \$20,000 20,000+ users - \$24,000 Host in the Cloud: 10 users - \$10/mo 15 users - \$100/mo 25 users - \$200/mo 50 users - \$300/mo 100 users - \$400/mo 2,000 users - \$1,100 /mo	Cloud Plan - From \$2,400: Up to 25 users cost \$2,400. Up to 50 users cost \$4,200. Up to 75 users cost \$5,400. Up to 100 users cost \$6,000. More than 100 users - cost available by quote Enterprise Plan - From \$2,400: Up to 25 users cost \$2,400. Up to 50 users cost \$4,200. Up to 75 users cost \$5,400. Up to 100 users cost \$6,000. More than 100 users - cost available by quote	50 users-2,500 \$/year there are different pricing plans includes free trial, open-source, subscription. The package can either be licensed in perpetuity or priced per user per month. Its perpetual license option is available for a limited number of members. The starting price is \$8,400/year for first year up to 300 users. Annual subscription start from \$50/month/user different plans Basic: - Plus: \$500/year/user(s) Plus: \$50/month/user(s)	50 curators, 100 content teams - 12,000 € For individuals: Pro Annual - \$11/month Business Annual - \$87/month Content Director - starts at \$333/month (billed annually) For enterprises - prices discussed privately, custom package Bronze (5 curators, 10 content teams) - for teams Silver (10 curators, 30 content teams) - for small and mediumsize companies Bronze (50 curators, 100 content teams) - for enterprises
Per user price							

Appendix E: Flow Chart of Recommended Process



Appendix F: Symbols Applied in CKM Flowchart

